INVESTIGATION OF THE EFFECTS OF INCREASED FLYING HOURS ON NAVAL POSTGRADUATE SCHOOL AVIATOR SKILL, KNOWLEDGE, AND SATISFACTION; A COMPARATIVE ANALYSIS

By

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THESIS

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ABSTRACT

Data reflecting the knowledge, skill, and satisfaction of aviators in combat readiness training (CRT) flight status, was collected. The aviator sample consisted of one group flying the T-1A aircraft at a rate of 4-hours per month and another flying 8-hours per month. The data collection methods are described, and the results and conclusions from a comparative analysis are presented.

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I. INTRODUCTION

A. PURPOSE AND OBJECTIVES

Upon cancellation of the expected switchover to the leased civil jet aircraft, CNO (OP56) authorized the continuation of the CRT study to determine if any significant differences exist in the level of flying skill, knowledge, and satisfaction for aviators flying 8-hours per month versus those flying 4-hours per month. It was expected that if the greater number of flying hours per month provided higher levels of skill, knowledge, and satisfaction, then a determination that upgrading the present generally reduced level of 4-hours per month CRT flying activity to 8-hours might be appropriate and beneficial.

B. BACKGROUND

During the spring of 1970 data collection methods were developed to ascertain the levels of flying skill, knowledge, and satisfaction of aviator students assigned to the Naval Postgraduate School, Monterey, California. While at NPS, aviator students are specified as being in a CRT (combat readiness training or proficiency flying) status. All such flying is conducted at NALF Monterey, an auxiliary to NAS Alameda.

Upon the request of CNO (OP-56) a study group was formed at NPS to investigate the efficacy of switching from the T-1A to a leased civil jet aircraft as the jet proficiency

aircraft at NALF Monterey. Also, the study group undertook the determination of the essential elements of combat readiness training, skill definitions, and levels of satisfaction. Data collection methods were devised for the purpose of comparing the T-1A and the leased civil jet with regard to those three major categories.

Initial data collection in the T-1A aircraft began in June, and terminated in July 1970. Results of that data collection were reported in reference [7]. The planned switch to the leased civil jet on 1 July 1970 did not occur. Subsequently, authorization was received to fly forty (40) aviators at a rate of 8-hours per month in the T-1A as continuation of the study.

The upgraded level of flying activity began immediately for the forty aviators and extended through December 1970. During October 1970 a T-1A systems and procedures examination was administered to 37 of the 8-hour per month group and a randomly selected group of 37 additional aviators who had remained flying the 4-hours per month schedule. Two aviators of the original 8-hour group were unexpectedly transferred but were replaced in the 8-hour group, and three were lost to hospitalization.

The second round of airborne data collection flights began 15 November and terminated 30 December 1970. During that time frame one member of the 4-hour data group and one data recorder were hospitalized after an ejection on a data collection flight, and the data was lost.

II. THE STUDY

A. GENERAL

The study consisted of collecting data in the form of a questionnaire, an examination, and an airborne data flight. The sequel will present the results of those steps in order of occurrence. Any noteworthy results which will not be considered analytically are presented as they occur. Acronyms and abbreviations will be defined also as they occur, and any peculiar presentation of data will be appropriately explained as it occurs.

B. THE QUESTIONNAIRE

The following is a resume of responses of the two subject groups to the various questions on the questionnaire. The questionnaire is contained in Appendix A. Several questions were directed to the 8-hour group only and are appropriately annotated to that effect. In the sequel each question is treated separately and includes the responses of both groups. Any comments or accounting techniques used which might be special to a particular question are also noted.

Questions #1 through #3

These questions required that each aviator state his name, file number, and 4-hour or 8-hour group or data recorder assignment.

Question #4

Are you NATOPS qualified in the T-1A?

8-hour Group

Yes - 37

No - 0

4-hour Group

Yes - 36

No - 1

Question #5

Do you fly the T-1A at NALF [Monterey] exclusively?

8-hour Group

Yes - 34

No - 3

4-hour Group

Yes - 33

No - 4 .

Question #6 (8-hour group)

Do you fly at other stations?

Answers

Yes - 2

No - 35

Note: The two Yes responses included the following amplifying information:

Question #6A

If so, where and what type(s) or aircraft?

Answers

(1) "T-33, F-4, TA-4F, A6A at Miramar, Point Mugu, and Lemoore."

(2) "T-28 at NLC (Lemoore)."

Question #6B

How many hours per month on the average?

Answers

(1) "30 hours over 12 months. 30/12 = 2.5 hrs/mo."

(2) "1-2 hours."

Question #6 (4-hour group)

Do you fly at other stations?

Answers

Yes - 6

No - 31

Note: The 6 Yes responses included the following amplifying information. The number of aviators mentioning a particular aircraft and air station is shown in parentheses.

Question #6A

If so, where and what type(s) of aircraft?

Answers

(1) A7 (1),

(2) A4 (2),

(3) TA-4F (2),

(4) P3 (1),

(5) NAS Lemoore (5),

(6) NAS Moffett (1)

Question #6B

How many hours per month on the average?

Answers

8, 1-2, 1, 4, 2-6, and 3 hours.

Question #7

Please indicate your personal subjective feeling about the T-1A with regard to:

Question #7A

Confidence in the T-1A and systems?

4-hour Group

-- Reliable

-- Fair (4)

-- Good nav [navigation equipment], dependable A/C aircraft

-- Moderate

-- Good overall, guarded [confidence] on nav gear and radio

-- Good (6)

-- Could be higher

-- Yes (2)

-- Good aircraft, bad radios

-- Little confidence in

-- Reasonably confident

-- Poor (3)

-- Highly confident

-- Little

-- OK (2)

-- The aircraft has an excellent accident record - I find confidence in that fact

-- Confident (except for nav systems other than TACAN)

-- Marginal

-- Fairly confident

-- Obsolete aircraft, tired

-- Confident in everything except escape system

-- Fairly

-- Satisfactory (2)

-- Worse than most

8-hour Group

-- Confident but not highly confident

-- Adequate (good for instrument work)

-- Yes

-- Good (4)

-- I have much confidence in the T-1A airframe and power plant but find the reliability of the radio and navigation gear questionable at times

-- Confidence is in myself more than the aircraft

-- Very good

-- Excellent

-- Marginal (3)

-- Should be limited to day VFR

-- Moderate

-- Fair (2)

-- Very poor aircraft; confidence lowered further by attitude of maintenance and [flight] line personnel at NALF Monterey.

-- Poor (2)

-- OK except for avionics systems

-- Systems unsat.

-- Confident (2)

-- OK (3)

-- Relatively confident

-- Fairly confident (2)

-- Average

-- I feel it is quite well considering age and parts problems

-- I'm not confident at all!

-- In basic equipment, OK; in maintenance quality, no confidence at all

-- T-1A fine, not sure about NALF maintenance

-- Not much!

Question #7B

Comfort of cockpit and seat?

4-hour Group

-- Unsat (2)

-- Poor (8)

-- Very poor (2)

-- Miserable!

-- Seat is unsat. for comfort

-- Uncomfortable

-- Fair (3)

-- Back seat comfortable. Front seat uncomfortable

-- Good

-- Hard seat

-- None

-- OK (3)

-- Fine

-- Very uncomfortable

-- Extremely uncomfortable

-- Cockpit uncomfortable, Martin-Baker Seat uncomfortable at Monterey airport

-- Reasonably comfortable

-- Uncomfortable

-- Not comfortable after 1 hour (of flying)

-- Front seat terrible

-- Most uncomfortable ever!

-- Cockpit OK, seat poor

-- Front cockpit poor, back [rear cockpit] OK

-- Seat uncomfortable

8-hour Group

-- OK (4)

-- It's not!

-- Average

-- Fairly, rear cockpit; extremely poor front cockpit

-- No, worse than any other aircraft

-- Front seat uncomfortable

-- No comfort, lots of confidence [in seat]

-- Fair (2)

-- Poor (6)

-- Uncomfortable (3)

-- Front seat is awful

-- Very poor

-- Satisfactory

-- Rather uncomfortable

-- Very uncomfortable (2)

-- Good to excellent

-- Not very

-- Unsatisfactory

-- Cockpit OK, seat - very bad

-- Very unsatisfactory

-- Good (2)

-- Forward cockpit terrible, not enough leg room

-- Front cockpit [comfortable]

-- Find it uncomfortable

Question #7C

Fun to fly?

4-hour Group

-- No (4)

-- Good (3)

-- Not if you want more than 1.1 (hours per flight)!

-- Fair (better than nothing)

-- Yes (except for landing on wet runway)

-- For a one-leg hop, yes!

-- The airplane - yes

-- Yes (9)

-- Not particularly

-- Sort of

-- Fair (2)

-- More fun to fly than anything else that's available to me here

-- Great

-- Very little

-- OK (2)

-- Marginal

-- Average (2)

-- It beats driving a car

-- Better than nothing

-- I've flown better

-- Very poor

8-hour Group

-- No, under present [flight] time limitations

-- Fair (5)

-- Yes (3)

-- OK (so-so)

-- Poor

-- No, too many restrictions

-- Aircraft is OK, however it would be nice to do something besides bore holes

-- OK (3)

-- "--"

-- At times

-- Average

-- No - legs too short

-- Yes (2)

-- Yes, but what [kinds of] flying can you do?

-- Reasonably

-- A "zero" due to type flying

-- Good

-- More so than the S-2

-- At times

-- Better than no aircraft at all

-- No

-- Not very

-- Worst aircraft I've ever flown

-- Slightly less than satisfactory, poor

-- Somewhat enjoyable

-- Quite a bit

-- OK (short legs worst problem)

-- Very much

Question #7D

How well flying the T-1A maintains your flying skills.

4-hour Group

-- Marginal

-- Average

-- Very poor

-- As well as any other aircraft in which I was not previously qualified

-- Better than a non-jet or not flying at all

-- As well as any aircraft could on 4 hours per month

-- It doesn't; a waste of time and money (at 4 hours per month)

-- Good

-- At 4 hours a month, not at all

-- Not enough time per month

-- Marginal

-- Fair (4)

-- It spoils me (too easy)

-- Good enough - better than props

-- As much as any aircraft under the circumstances

-- OK if more flight time available

-- Very much. Have to stay especially alert for problems, fuel, weather, etc.

-- Not very well; if I were flying 8-12 hours/ month things would be much more satisfactory

-- OK

-- Good (4)

-- Adequate for minimum skill

-- Medium

-- For instrument flying it does OK

-- It keeps me in the environment and marginally proficient IFR; OK VFR

-- Well enough

-- Moderately

-- Poor

-- Minimum

-- At 4-hours per month, just a bit better than none

-- Fair IFR flying but poor overall

-- At 4-hours/month - will not

8-hour Group

-- Adequate (2)

-- I feel safe for VFR operations only

-- Fairly well at 8-hours per month

-- Good for instruments, poor [for] all other areas

-- Not much, only 4-hours of actual instrument time

-- Good (4)

-- Average

-- It keeps me moderately proficient in instruments

-- Fair

-- At Monterey where it becomes necessary to fly most hops at maximum endurance it does very little for flying skills or desire to fly

-- Poor

-- Instruments, OK; anything else poor

-- Has no effect

-- Marginal

-- Maintains them

-- OK (4)

-- Almost no maintenance of proficiency for combat requirements. (Bombing, formation, low-level, intercept, etc.)

-- Pretty well

-- Generally good, needs instrument hood

-- Good for this purpose except as noted in C. (OK, short legs worst problem)

-- Contributes toward but not significantly

-- As well as any other aircraft

-- "Reasonably" well. A good instrument aircraft when navigation gear is working

-- Keeps me on my toes

-- Relatively little

-- Same as above (better than no aircraft at all)

-- Very few skills are maintained (take-off, landings, and straight and level)

-- Instrument skills - OK; "fighter" skills - "zero."

-- Instrument-wise - OK; but not tactically

Question #8

Concerning CRT flying at NPS, answer all of the below listed questions:

Question #8A

Does CRT flying interfere with your study time?

4-hour Group

Yes - 4

No - 24

Additional responses:

-- Some (2)

-- Infrequently

-- At times

-- Sometimes (2)

-- Very little

-- On occasion

-- Yes, some

Comment: Considering all answers in the yes/no count, the following percentages were determined:

Yes = 13 = 35.2%

NO = 24 = 64.8%

8-hour Group

Yes - 12

No - 17

Additional comments:

-- On occasion

-- A little

-- 8-hours per month does; 4-hours per month doesn't

-- Not now; [it] did earlier

-- Sometimes (2)

-- Occasionally when required to fly just prior to an examination

-- Some

Comment: In terms of overall yes/no responses, the following percentages were determined:

Yes = 20 = 54.2%

No = 17 = 45.8%

Test: A comparison of the 4-hour group versus the 8-hour group responses using Chi-square test yielded the following:

	YES	NO	
4-hour	A 13 (16.5)	B 24 (20.5)	37
8-hour	C 20 (16.5)	17 (20.5)	37
	33	41	74

$$\chi^2(1, .05) = \frac{74\ [(|221 - 480|) - 37)]^2}{(37)\ (37)\ (33)\ (41)} = 1.97 \rightarrow p \simeq .15 > .05 = \alpha$$

and hence there is no significant difference between the groups in their Yes/No ratings.

Question #8B

Have your grades suffered through having to take time to fly?

4-hour Group

Yes - 1

No - 32

Additional responses:

-- Sometimes

-- Yes, because aircraft (made ready for flight) late, takeoff(s) so late, etc., plus meetings to justify. Compounds problem mroe than flying

-- A bit

-- Don't think so

-- Percentage breakdown:

Yes = 4 = 10.8%

No = 33 = 89.2%

8-hour Group

Yes - 5

No - 28

Additional responses:

-- Some [academic] quarters

-- Doubtful

-- Somewhat

-- [Grades have] gone up - very good for morale

Percentage breakdown:

Yes = 7 = 19.0%

No = 30 = 81.0%

Test: A comparison of the 4-hour group versus the 8-hour group responses using Chi-Square Test is as follows:

	YES		NO		
4-hour	A 4	5.5	B 33	31.5	37
8-hour	C 7	5.5	D 30	31.5	37
	11		63		74

$$\chi^2(1, .05) = \frac{74\ (|120 - 231| - 37)^2}{(37)\ (37)\ (11)\ (63)} = 0.428 \rightarrow p \simeq 0.60 > .05$$

Hence, there is no difference in ratings of the two groups.

Question #8C

Which would you prefer, 4-hours per month or no flying at all, given that no other alternatives are possible?

4-hour Group

-- 4-hours per month (28)

-- Here at PGS I would say no flying

-- Something other than T-1A - 4-hours

-- 4-hours better than nothing

-- No flying, given [that] 4-hours is only [available] alternative

-- 4-hours per month!!!! I feel strongly about it.

-- No flying

-- None at all

-- None

-- No flying at all. At 4-hours a month strictly VFR type flight should be attempted and certainly no night flying, landing [at night] at NALF is anything but optimum

8-hour Group

-- 4-hours per month (24)

-- No flying at all (3)

-- 4-hours a month limited to day/VFR

-- No fly(ing) (2)

-- Under present conditions at Monterey - 0. [But] in the T-28 - 4-hours/month

-- No fly if still flight pay; otherwise 4-hours

-- None, given some of the weather conditions we have to fly in.

-- 4-hours/month (one x-c)

-- 4-hours/month is infinitely better than no flying at all!

-- 4-hours, emphatically!

-- The only reason I don't want to fly is my lack of confidence in the aircraft. Therefore, if given flight pay without flying, I'd accept it!

Comment: Frequency breakdown of responses.

4-hour Group

4-hours = 31 = 83.8%

No flying = 6 = 16.2%

8-hour Group

4-hours = 29 = 78.4%

No flying = 8 = 21.6%

Combined

4-hours = 60 = 81.2% Would want 4-hrs/mo.in pref. to no flying

No flying = 14 = 18.8%

Comment: A comparison of the 4-hour group responses versus the 8-hour group responses using Chi-square test is as follows.

	4-hours	No fly	
4-hour	A 31 (30.0)	B 6 (7.0)	37
8-hour	C 29 (30.0)	D 8 (7.0)	37
	60	14	74

$$\chi^2(1, .05) = \frac{74[(|248-174|) - 37^2]}{(60)(14)(37)(37)} = 0.088 \rightarrow p \simeq 0.75 > .05.$$

Hence, no difference between ratings is noted. Four hours per month is considered preferable to no flying.

Question #8D

Do you prefer to accumulate your flying time on cross-countries or on the regular flying schedule? Why?

4-hour Group

-- Cross-countries; leaves week nights to study

-- Regular [schedule] -- too long between hops otherwise

-- Both, as regular flying [is] important, and cross-countries [are] good for instrument procedures

-- Regular schedule; I don't trust shutting down [the] T-1A anywhere else and need study time

-- Cross-country. Go on weekends

-- Some of both; cross-countries for diversion, regular [schedule] for maintaining currency and frequent flights

-- Regular [schedule] -- more hops spread out over [a given] period of time

-- Cross-countries, more realistic instrument training and not as boring

-- Cross-countries; I can work into my schedule better

-- Cross-countries; more realistic and I like to travel

-- No preference (3)

-- Regular flight schedule; takes less time from studies

-- Cross-countries; after flying to Lemoore and Moffett 50 times, it loses its instructional value

-- Yes [cross-countries]; can fly my own schedule and not fly same old route

-- Regular flight hours - less family separation

-- Cross-countries. Different places have different [instrument] approaches and departures. Around here you fly the same one over and over

-- Four-hours per month - regular flying schedule; 8-hours per month - cross countries

-- Cross-countries

-- Regular flying schedule, cross-countries would require weekend time

-- Cross-countries; would rather fly on weekends, like to get away, more enjoyable going somewhere than just making time locally

-- Regular schedule; cannot afford the time to RON [remain over night]

-- No [cross-countries], aircraft isn't reliable enough, maintenance level [is] crummy

-- Cross-countries - practice with unusual situations, different fields, get away from canned hops

-- Cross-countries; more on my own and don't have scheduling problem

-- Regular flying - stay up on procedures

-- A combination of both - [for] variety

-- Regular flying once or twice a month is better than one long cross-country

-- Regular schedule - must study on weekends

-- Cross-countries; get away from it all, feel more confident after a couple of back-to-back hops

-- Cross-countries; for diversification and choice of most opportune time for me to fly

-- Regular schedule with possibility of cross-country if desired

-- Regular [schedule]; too much "grinding" on cross-countries, too little practice in critical areas, e.g., landings, approaches

-- Cross-countries; get more out of it

-- Regular schedule, to keep proficient

-- Cross-countries - go somewhere other than Moffett

8-hour Group

-- Regular flying schedule. Can't sacrifice the time required for RON - this would interfere with my study time

-- Regular, since I have little enough time with my family and do not wish to give up weekends

-- A combination of the two breaks the routine of local area operations

-- Yes [presumably cross-countries], I get it out of the way, in the same aircraft, at one time

-- On cross-countries, I like to get away

-- [Cross-countries] sometimes because of quizzes

-- On both!

-- Regular schedule, less time away from books

-- Regular schedule, to retain skill (?)

-- Regular - with heavy schedule at school, want week-ends to self and family

-- Regular flying schedule, can plan on it and don't want to spend weekends flying

-- Cross-countries [since] ground [time spent] per flight houg. Plus, while on cross-countries I am afforded the opportunity to get a glimpse

-- Cross-countries, safer, more confidence

-- Regular flying schedule, cross-countries are "hole boring." Time should be scheduled to permit maximum activity. It is not now

-- Regular, too many restrictions on cross-countries, [and they] take up too much time

-- Cross-countries mixed with regular schedule, for some variety

-- Cross-countries, the schedule is poorly administered

-- Cross-countries; can get night and instrument time and accumulate necessary flight time

-- Cross-countries because of added purpose of going somewhere

-- Cross-countries; get a chance to look at new approaches, different fields, and different controllers

-- Cross-countries, more familiar with the aircraft when flying 4-5 flights close together

-- Cross-countries

-- Regular flying; better overall efficiency

-- Regular flying schedule. Time away from home

-- No [cross-countries]. I devote Friday nite and Saturday morning to the wife and kids.

-- Cross-countries. Better training time than round robins (they get old)

-- Both, weekly schedule is convenient but boring. Cross-countries get more flight time, more enjoyable, but obviously can't go every weekend.

-- Cross-countries. More relaxing

-- Regular schedule because don't have to worry about getting stuck in San Diego

-- On cross-countries, for personal planning reasons

-- Regular flying [schedule] with occasional cross-country. Easier to fit into the rest of my schedule

-- Cross-countries, better "real world" practice

-- Regular hops, cross-country too time consuming

-- Cross-countries, [can] negotiate own schedule

-- Cross-countries, (Poon!)

-- Regular schedule, want to spend my weekends with my family. I would never see them otherwise

Comment: Frequency breakdown of responses.

4-hour Group

Cross-countries = 16 = 43.3%

Regular schedule = 11 = 29.7%

Both = 6 = 16.2%

No preference = 4 = 10.8%

8-hour Group

Cross-countries = 18 = 48.7%

Regular schedule = 16 = 43.3%

Both = 3 = 8.0%

No preference = 0 = 0.0%

Question #8E

What sort of hops in the T-1A do you usually fly?

4-hour Group

-- You must be kidding - round robins between here and Moffett

-- Instrument round-robins and VFR to get aerobatics and touch-and-go's

-- Instrument round-robins (2)

-- Instrument approaches, touch-go's

-- Filed IFR flight plans

-- Half-assed round-robins, couple of touch-and-go landings

-- IFR round-robins with penetrations and approaches

-- IFR, TACAN [and] GCA [approaches] to touch-and-go's

-- VFR round-robins

-- Instrument (IFR) round robin(s) (4)

-- IFR instrument hops

-- Instruments (3)

-- One - half instruments - ½ bounce [practice landings], acrobatics, sight seeing

-- Cross-country

-- Instrument and test hops [for] Aero [aeronautical engineering] courses

-- IFR round-robin [to] NUQ (Moffett), VFR to NSU (Monterey)

-- IFR to Moffett with approaches at Lemoore and Moffett. Return to Monterey with approach

-- Round-robin, Monterey - Moffett - Monterey

-- Round-robin to NUQ (Moffett), refuel [and] return

-- IFR. Instrument oriented hops

-- IFR navigation flights

-- Instrument/ NATOPS check rides

-- IFR round-robin/ VFR test/ acrobatic

-- Round-robin (NUQ). Instrument hops

-- NATOPS/ instrument checks. Instrument round-robins

-- To Lemoore, rendezvous with fleet aircraft for airborne photos

-- Acrobatics during day VFR, instruments during IFR

-- VFR with acrobatics and touch-and-go landings, IFR with multiple approaches

-- [From] here to Moffett, IFR approaches

-- VFR navigation round-robin with approaches at FAT (Fresno), NLC (Lemoore), Aero [aeronautical engineering] class work [aircraft test flights]

8-hour Group

-- Instrument (4)

-- IFR mostly

-- Instrument and Flight Evaluation Hops [Experiments] [pertaining to this study]

-- Instruments/ NATOPS checkouts

-- (Since this damn study) - hole boring to try to catch up to the 8-hour [per month] curve. Before that 1.1 - 1.2 [hours per flight] with maximum emphasis on instrument work

-- Airways, instruments

-- Familiarization, VFR with ILS, TACAN, GCA approaches

-- Local (?)

-- Instruments, acrobatics

-- IFR round-robin to NUQ (NAS Moffett Field)

-- Round-robin: NSU (Monterey)-NUQ-NSU

-- Maximum endurance

-- Instrument training

-- Instruments; used to fly prebriefed formation on some day hops until the Bulletin came out prohibiting it

-- [Flight] checks and familiarization

-- Instruments and familiarization

-- IFR departure and route with approach to Moffett then VFR to another field (Lemoore usually) for another approach, then home

-- Half instrument practice and half data taking for flight evaluation course (CRT study)

-- IFR (2)

-- NSU (Monterey) - AVE (Avenal) - NUQ (Moffett); NUQ - AVE - NSU; IFR, then VFR

-- Cross-countries, round-robins

-- ½ instruments, ½ VFR

-- Instruments on first leg, VFR [on] second [leg]

-- Filed IFR; (only exception was when aircraft [was designated for] VFR only

-- IFR to penetration and acrobatics

-- VFR, if possible

-- 1 leg IFR with 2-4 approaches, 1 leg VFR with touch-and-go's [landings] and approaches

-- Cross-country navigation and instruments

-- Instrument round-robin

-- Round-robins

-- ½ IFR round-robin and ½ VFR for touch-and-go's, practice precautionary approaches, etc.

-- ½ instrument training, ½ acrobatics and aircraft familiarization

Comment: Frequency Breakdown by kind of mission:

4-hour Group

Instrument, IFR round-robin	33
Cross-countries	1
Instrument/NATOPS checks	0
Familiarization	0
VFR Navigation	3
Aerobatics	5
Maximum endurance	0
Formation	0
Touch-and-go landings	5
Test hops (Aeronautical Engineering)	2

8-hour Group

Instrument, IFR round-robin	27
Cross-countries	2
Instrument/NATOPS checks	2

Familiarization	2
VFR Navigation	7
Aerobatics	2
Maximum endurance	1
Formation	1
Touch-and-go landings	3

Question #8F

Short of actual weapons delivery or air combat maneuvering, what kinds of flights in the T-1A do you feel would help the most in maintaining your flight proficiency?

4-hour Group

-- Formation, VFR, acrobatics

-- Instrument work and some section flying to smooth out techniques and confidence

-- Low level navigation (but not enough gas), formation

-- IFR in VFR conditions

-- Instruments

-- VFR with acrobatics, touch-and-go landings, IFR with multiple approaches, plus some formation flying

-- Formation flights; simulated/actual instrument hops

-- Cross-countries to strange fields, and some formation work

-- Formation (particularly [formation] approaches) hops, FMLP [Field Mirror Landing Pattern] hops, instrument hops

-- Formation, cross-country, and instrument

-- Acrobatics, day visual navigation, instrument flying consisting mostly of approaches and departures

-- Formation flying

-- FCLP [Field Carrier Landing Practice] and Formation

-- Flying some low level [navigation] routes. Section formation work

-- Formation flying, sandblowers [low level navigation routes]

-- Airways and touch-and-go hops with GCA's. Exactly what we do now

-- Low level navigation

-- Scheduled two-plane formation, instrument round-robins

-- Formation flying and takeoffs in section (2 aircraft) plus mostly aerobatic or sandblower work while airborne

-- Instruments but also - formation, tactics, bounce [FCLP] maybe - things like that. I am very opposed to the prohibition of formation flying. [Formation is now prohibited at NALF Monterey]

-- Instrument hops, formation

-- Instruments, landings

-- Simulated combat navigation - formation

-- Same as scheduled

-- Section work, utilizing another aircraft for buddy approaches [practice air refueling], etc. Could maintain both instrument and formation status (proficiency)

-- Formation flying, basic section [tactics] work, instrument flying

-- More time primarily. Formation/ low level navigation

-- Formation, sandblowers

-- IFR round-robins with penetrations and approaches

-- That only leaves instrument flying. Low level navigation flights would be impractical

-- Low level navigation, formation, FMLP's

-- Instrument round-robin with a period of aerobatics at the end seems to be all I can do considering the fuel shortage [elimination of JP-4 from supply inventories] and the legs [endurance, flight duration] of the aircraft

-- Instruments, approaches, landings. Would like to maintain formation proficiency, may need it to get in [emergency instrument approach on the wing of another aircraft] some day

-- Sandblowers, formation

-- Instruments, GCA's, airways work, basic [air combat] maneuvering

-- Airways instrument training to different fields for approaches and GCA's. Should not have to stretch time spent in the air

8-hour Group

-- Instruments (4)

-- IFR first leg, VFR second leg for touch-and-go's and ILS at homeplate [Monterey]

-- Formation flights, acrobatics, visual navigation routes, touch-and-go landings, GCA's, simulated weapons delivery[1]

-- Instrument, more time VFR for landings

-- If each aviator could get some of the following flights: IFR round-robins, VFR low-level [navigation], and IFR/VFR round-robin cross-countries, i.e. with stops enroute

-- Round-robins

-- Instrument flying

-- Cross-countries, navigation, and instruments

-- [Enough] time and fuel [exist on hops] for acrobatics, formation work, low-level navigation

[1]Standard procedure for new pilots in weapons training flight patterns.

-- Instrument training under the bag [hood]

-- Formation, MLP, instruments

-- Nothing short of air-combat maneuvering is of any value

-- Instrument hops, [presumably the aircraft is] not capable of anything else

-- Formation (3)

-- Formation, acrobatics

-- Instruments (GCA), formation, sandblowers [low level navigation routes]

-- Some formation and low-level navigation

-- Formation and low-level navigation

-- Formation, acrobatics, more night flights, low-level navigation

-- A need for a training program, VFR navigation, low-level navigation

-- Touch-and-go's, ILS approaches, precision GCA's

-- Formation [in general] and section [two aircraft] work in particular

-- Flights should continue as scheduled with first leg as an instrument flight to Moffett, and second leg a formation flight terminating at NSU [Monterey]

-- FMLP and GCA with occasional acrobatic hop. Really don't get the opportunity to shoot enough landings - on round-robins to Moffett pattern is strung out - slow and can't shoot [landings] at Monterey - Crow's [Crow's Landing ALF] seldom open

-- Formation, MLP, Low-level navigation, intercepts with a GCI site

-- MLP hops and acrobatics along with IFR procedures

-- Instruments, aerobatics, and formation

-- Anything other than straight and level IFR

-- More flying!

-- Hooded instrument flights filed IFR into as many different fields as possible

-- Two plane tactics, instruments (preferably with a hood installed). Really begging the question - the T-1A is unsat.!

-- Instruments/cross-country

Comment: Frequency breakdown by type of mission:

GCI intercepts	1
Night flying	1
Formation	36
Acrobatics	11
IFR round-robins	4
VFR	2
Simulated/actual instruments (approaches)	38
High/low level VFR navigation	22
Touch-and-go landings (and FMLP)	15
Cross-countries	5
Tactics (ACM)	5
Simulated air refueling	1
Simulated weapons delivery	1

Question #8G

Rank the following characteristics of aviator proficiency:

4-hour Group: Ranking in order of mean score.

Ranking	Title	Max. Rank	Min. Rank	Mean	Variance	Rank Total
1.	Personal Aviator Confidence	7	1	2.08	2.38	77.0
2.	Instrument Flying Ability	6	1	2.89	2.81	107.0
3.	Dexterity in Mechanical Skills	7	1	3.68	4.18	136.0
4.	Attitude toward flying	7	1	3.81	1.92	141.0
5.	Personal confidence or sense of accomplishment	7	2	4.73	2.28	175.0
6.	Knowledge of ARTC Procedures	7	2	4.84	2.17	179.0
7.	Accustomedness to G-loading, steep aircraft attitudes, & rapid rates-of-roll	7	1	5.73	2.45	2.210

8-hour Group: Ranking in order of mean score.

Ranking	Title	Max. Rank	Min. Rank	Mean	Variance	Rank Total
1.	Personal Aviator Confidence	7	1	2.33	2.03	87.0
2.	Attitude toward flying	7	1	2.38	2.24	88.0
3.	Instrument Flying Ability	7	1	3.38	4.02	125.0
4.	Dexterity in Mechanical Skills	6	1	3.73	1.812	138.0
5.	Personal confidence or sense of accomplishment	7	1	4.87	2.79	180.0
6.	Knowledge of ARTC Procedures	7	1	5.33	2.27	197.0
7.	Accustomedness to G-loading, steep aircraft attitudes, & rapid rates-of-roll	7	1	5.63	2.81	208.0

One aviator ranked (1) and (2) equally.

One aviator ranked (4) and (5) equally.

Mann-Whitney U-test

2.08 -4 C
2.33 -8 E
2.38 -8 E
2.89 -4 C
3.38 -8 E
3.68 -8 E
3.73 -8 E
3.81 -4 C
4.73 -4 C
4.84 -4 C
4.87 -8 E
5.33 -8 E
5.63 -8 E
5.73 -4 C

$0 + 2 + 3 + 4 + 4 + 4 + 7 = 24$

$p = 0.500 > \text{any } \alpha < 0.500$ hence accept H_o that no significant difference exists between the groups.

ANALYSIS OF VARIANCE

	Sum of Squares	DF	Mean Square	F Ratio
Between Groups	0.0009	1.	0.0009	0.0005*
Within Groups	20.3159	12.	1.6930	
Total	20.3168	13.		

*Not significant for any α

Hence, no significant difference exists between the sets of rankings using either test.

TREATMENT IN RANKED ORDER

Rank	Label	Mean	Number of Replications	Treatment Number
1	1	3.950	7.	1
2	2	3.966	7.	2

COMPUTED RANGES FOR ALPHA = 0.05
(Duncan's New Multiple Range Test)

No. of Groups in Subset	Range
2	3.0754

This test confirms no significant difference between treatment means, or variances. Thus, both groups consider confidence, attitude toward flying, instrument flying ability, and dexterity in mechanical skills as the four most important characteristics of aviator proficiency. Confidence was ranked number one by both groups.

Question #8H

If offered the opportunity to be excused from flying and still receive flight pay, would you request such excusal? Why?

4-hour Group

-- No, I like to fly - I'm a pilot

-- No, I might if it was extremely inconcenient to fly and still handle my other requirements such as here at school

-- No, I like to fly! (2)

-- Yes. But offered some other type aircraft (T-A4, T-28, T-39), no

-- No, some flight time is better than none, just to keep my hand in

-- No, I enjoy flying. It continues to provide a sense of personal satisfaction even if not under ideal conditions

-- No, flying is one reason I'm here - I wouldn't personally feel that it [flight pay] has been earned. We should fly if at all possible

-- No! I need the occasional flights to fulfill an actual physical need! (Personal pride and satisfaction.)

-- No! I'm an aviator and I enjoy being in the air

-- No - [I] like to fly (2)

-- No. The time spent in a flying/cockpit environment is invaluable. Carpenters carpent, plumbers plumb, and aviators aviate

-- No, because I like to fly occasionally and I wouldn't feel very confident later when I started flying again

-- No, I feel I need to keep flying so when I go back to the fleet I can get into an A-7 with some degree of confidence, (e.g.), I can land it on [my] first hop

-- No

-- No, 4-hours [per month] in T-1A [is] poor CRT, but it's still flying

-- No - No - No - No!

-- No. [I] like to fly too much

-- Negative, I want to continue to fly on all tours during my Navy career

-- No - I love to fly, and always have. I dread the day when I won't be able to fly

-- No - [because of the] freedom and enjoyment of flying

-- Yes, current amount of flying available does not allow the maintenance of sufficient self-confidence to merit the expenditure of time away from more productive pursuits

-- No. I like to fly, plus I feel like it means being proficient for fleet flying which I need

-- No, [I] believe one needs to continue flying to keep a basic level of proficiency

-- Yes. As noted before, I value personal aviator confidence highly. I am losing this confidence while flying at such minimal rate

-- No. Any flying is better than none at all

-- No, if allowed to fly 8-hours a mont. Yes, if allowed to fly only 4-hours per month, [i.e.] just not proficient enough to handle any problems that might occur

-- Yes, I don't think 4-hours/month maintains proficiency. Before reporting to operational billet one goes to a RAG anyway

-- Yes. At four hours a month I do not feel able to maintain a high enough level of proficiency

-- No, not as long as I had the opportunity to fly. That's why I joined, and that's why I stayed in the Navy

-- NO!!!

-- Yes, if I could still fly on my own at other bases

-- Possibly - if the aircraft [used for CRT] are not indicative of what is expected in the fleet then they should be eliminated

-- No. Enjoy it too much; do not feel it would have much effect on future proficiency

8-hour Group

-- Yes [at Monterey only], [I am] here to study, not [to] spend 7-hours trying to get 3-hours of worthless "straight and level" flight time

-- No, 'cause I like to fly! (2)

-- No, I live to fly!

-- No. (3)

-- No - not in line with aviation philosophy

-- No, flying is the only pleasant past-time here. If I was told I could go to Monterey but not fly I would NOT come

-- No, only because it wouldn't last. The submariners particularly would raise a stink like you've never imagined and we would lost flight pay

-- No, because I like to fly and consider it important to maintain contact with aviation even though we are severely restricted

-- Yes, prefer extra 10-hours or so in the RAG (RCVW) vice CRT. Cost excessive (CRT) for gains (minimal). Too time consuming

-- Here yes, for all reasons mentioned previously [This aviator was extremely critical of the T-1A, CRT in general, and CRT at Monterey in particular].

-- No, might engender an attitude of "snivellin" which is incompatible with fleet ops. "Might" is enough reason to keep flying

-- Yes, I feel that the basic skill of flying is not lost and that the RAG's can do their assigned jobs of requalificating pilots

-- No, some flying is necessary to keep me oriented toward aviation, which after all is my speciality

-- Yes, waste most of the day to get 3-hours [flight time]. Boring routine hop-after-hop

-- No, not if I could maintain an 8-hours per month minimum

-- Not if there was the alternative of flying, because flying keeps me motivated as a naval officer

-- No, enjoy flying and feel need to keep my hand in as much as possible

-- Yes, explained earlier [lack of confidence in aircraft and systems.]

-- Definitely not, I am going back to a high performance aircraft (F-14, F-4) and I don't want my first hop in 2 years to be in it [a high performance aircraft]

-- Yes, because of crummy aircraft

-- No, still would like to get at least 4-hours per month

-- No, would like to benefit from as much flying as possible consistant with school work

-- Yes, if on 4-hours a month, since I wouldn't be an accident looking for a place to happen. I prefer the 8-hours a month

-- If there is a continuation of the 4-hours per month maximum, Yes! Not qualified in IFR conditions

-- No. I enjoy flying

-- No. I love to fly. It's my career, therefore it would be demeaning if I were forced to stop

-- Yes, I feel that within one month after my return to normal flight duty I wouldn't be at the same level proficiency with or without CRT flying in the T-1A

-- No, would rather fly and receive nothing

-- No. I consider flying an integral part of professional development for aviation command. If you don't want to fly, there's plenty of DD's [destroyers for duty] available

-- No, strongly believe that fighter/attack pilots need to continually train in order to retain satisfactory proficiency

-- No. Need to keep hand in flying and personal enjoyment

-- No. The flying is very important to me personally. Flight pay is a nice thing to have, but flying is more important than flight pay

-- Yes. My flying days as operational are nil. So, why not, maybe [it would] provide better aircraft and availability for the young bucks

-- No, I'd like to keep my hand in the game

Comment: Frequency counts and percentage breakdown of combined and individual group responses.

Combined

Yes - 17 = 24.3%

No - 53 = 75.7%

4-hour Group

Yes - 6 = 18.8%

No - 26 = 81.2%

8-hour Group

Yes - 11 = 29.7%

No - 26 = 70.3%

Comparison of 4-hour group responses to 8-hour group responses using Chi-square test yields the following.

	YES		NO		
4-hour	A 6	7.9	B 26	24.1	32
8-hour	C 11	9.1	D 26	27.9	37
	17		52		69

$$\chi^2(1, .05) = \frac{69\ (|156 - 286| - \frac{69}{2})^2}{(17)\ (52)\ (32)\ (37)} = 0.602 \rightarrow p \simeq 0.35 > .05.$$

Hence, no signigicant differences in responses between the two groups.

Question #8I

If you have not been excused from flying, and flying at Fritsche or NALF has been curtailed, would you partake of flying at, say, Moffett rather than be excused?

4-hour Group

Yes - 16

No - 6

Associated responses:

-- I would attempt to try to [at] Lemoore

-- Fly T-1A's - NO! [Fly] fleet attack aircraft-yes

-- Yes, unless rapid transportation available. [This aviator must have meant no.]

-- No, too far [and would] cut into study time

-- Not as a requirement - if I could write my own schedul - yes

-- [Yes], if the Navy would get me to and from Moffett with a minimum of wasted time and I could fly a tactical type jet aircraft

-- Yes, at NAS Lemoore

-- [Yes], if transportation was provided

-- No, too much time consumed

-- Most certainly!

-- Yes, given a descent (sic) jet aircraft

-- Depends on type aircraft; T-1A no

-- Depends on current [academic] quarter workload

8-hour Group

Yes - 23

No - 12

Neither - 1

Both - 1

Comments noted with the Yes/No answers:

-- Yes, but it would be quite an inconvenience!

-- If A4 or fleet type aircraft, Yes, Otherwise no, because time required would start to interfere on study time

-- Yes, unless conditions of time proved prohibitive

-- No, unless F4 type aircraft were available

-- No, jet type too inconvenient

-- No, not unless they provided VA aircraft [operational attack models]

-- Yes, if each time I went to Moffett I was sure I would get to fly

-- Yes, to get flight pay. If flight pay and no fly, I have no desire or ability to fly the P-3 [principal model of aircraft flown at NAS Moffett]

-- Yes, providing a "good" aircraft was available (A4)

-- [Yes] if transportation were available and convenient

-- In what? Reasonable aircraft Yes; but not to sit in back seat of (a) many motor [multi-engined aircraft] and ride

-- Yes, in a descent aircraft - TA-4.

-- Not P-3's, but I would go to Alameda or Lemoore

-- No, 'cause I like to fly!

-- No, aren't any fighter aircraft at Moffett

Comment Question #8I

Total Yes - 47 = 64.3%

Total No - 24 = 32.9%

Total Neither - 1 = 1.4%

Total Both - 1 = 1.4%

The "Both" and "Neither" were specifically stated in these terms but several other answers included in "Yes" and "No" could be interpreted as Both/Neither.

Question #8J

If the answer to the preceding question was yes, would you prefer private or government transportation to and from flying?

4-hour Group

Government - 12

Private - 4

Additional comments:

-- Private (reimbursable)

-- Private (or perhaps gov't bus)

-- Reimbursed private

-- Gov't, although to me it really doesn't make any difference - I'd go anyway

-- Government, or if that proved to waste too much of my time then private transportation with full reimbursement for travel expenses

-- Private - expense paid

-- (1) Private with reimbursement, (2) Gov't

-- Private with reimbursement by gov't

-- Anything - just get us there!!

8-hour Group

No preference/either - 2

Not applicable - 11

Government - 16

Private - 8

Additional comments:

-- Don't care

-- Private, just pay for the gas up, that is all I ask

-- Private (possibly reimbursed)

-- Any way I can get there; probably private would interfere least

-- Depends on distance, probably government with occasional deviations

Question #8K (8-hour group only)

Compare 4-hours per month versus 8-hours per month with respect to:

(1) Personal confidence. Do you feel "safe" and capable of handling any situation without making a "silly" mistake or omission?

-- Much more

-- I feel safe and confident but everyone is susceptable to a "silly" mistake or omission no matter how proficient

-- I feel a lot better on 8-hours/month than on 4-hours/month

-- Yes (24)

-- 8-hours [per month] helps but it is the type of flying that makes the difference

-- Better than 4-hours, but still not enough. (Flying) once a week is not adequate and we don't get that

-- Safe - Yes; chance of making "silly" but safe mistake high

-- Better than if I were limited to 4-hours/month

-- Yes! While flying 4-hours a month each flight was a happening!

-- No - 1.5 [hours] in July, 1.6 in August, ? in Sept., 11.5 in Oct. ---

-- More so than at 4 [hours]/month

-- Much better

-- Perhaps slightly more so.

-- For the most part

-- Better than before, and more adept than my 4-hour [per month group] contemporaries

-- No

-- I feel 8-hours has greatly improved my confidence and ability to react quickly and safely while flying

-- Generally yes, except for an emergency requiring instant action

-- No more than when flying 4-hours

-- Yes, more so

-- In reasonable weather and conditions, yes with either 4 or 8 hours monthly

-- No more so

-- No, because I need to fly more often and not get 3-hours every flight

-- 4-hours is grim. Better at 8

-- The extra four hours is the difference - I feel capable

-- More so than when flying 4-hours/month, but no expert with 8-hours/month

-- Only to a small extent

(2) Do you consider yourself better suited to handle marginal weather conditions?

-- Yes, but total hours doesn't dictate this as much as the number of flights

-- Absolutely

-- Yes (5)

-- Yes, definitely

-- Yes, just by being a little more familiar with the feel

-- No (3)

-- No, 8-hours still not enough

-- Yes, [but] certainly not to [instrument approach] minimums though

-- Yes, but I still feel that IFR hoods should be available for the rear cockpit

-- Yes, however equipping aircraft with instrument hoods in the rear cockpit would be much more ideal

-- Slightly

-- Yes, (very much so)

-- Yes, because I have repeatedly done it

-- Yes, after 11.5 [hours in] Oct., but still won't fly in [marginal weather] if at all possible

-- Not really, still wouldn't push it

-- Not here and in this aircraft

-- Yes, a little better

-- Yes, also better at night

(3) Does 8-hours versus 4-hours have any effect on your attitude toward flying?

-- Yes (4)

-- No (10)

-- Yes, I desire more flying now that I fly 8-hours

-- Yes, more aggressive

-- Yes, I enjoy 8-hours/month more than 4-hours/month

-- I don't fear it as much in marginal weather

-- Not in this aircraft

-- I still want to fly as much as I can

-- Yes, enjoy flying more

-- Mixed emotions, AE [Aeronautical Engineering] program pretty heavy workload

-- Not the way I got 8-hours

-- I enjoy the challenge knowing I can meet it

-- No, if anything it has a negative affect in that I am scheduled every week

-- No, still love it the same

-- Yes, once you're flying regularly it seems a lot less trouble

-- My attitude remains the same, but I want still more

-- Yes, feel more confident in the aircraft

-- Yes, positively

-- I can see how it could adversely effect some students study time but it hasn't been a factor for mine. I feel better about flying when I fly 8-hours [per month]

-- Feel more confident and therefore enjoy it more

-- Better

-- Yes, it increases it

-- Yes, I feel more confident in the aircraft

-- Yes, I much prefer it (old saying - the more you fly, the more you like to fly; the less, the less you like to fly)

-- Not really, I have to be able to get 25 hours per month to be happy

(4) Is there any noticeable difference in your mechanical flying abilities?

-- No, previous experience (4,000 hours) prevents deterioration in either the 4 or 8-hour case

-- Definitely

-- No (10)

-- Yes (12)

-- Not really but I guess my [instrument flying] scan is better now [in IFR] than when [I was] in the 4-hour group

-- Yes, I have flown every week. I do not feel it is the hours, but the number of hops [presumably over a given calendar period]

-- I feel that I definitely fly smoother at 8-hours per month

-- Yes, able to fly the aircraft better on instruments

-- Little

-- Yes, ability to maintain smooth instrument flight enhanced but other types of flying not tested so don't know

-- Yes, improved

-- I don't think there's a noticeable difference

-- Much better

-- Some better

-- Not really

-- Yes - more professional

-- Better approaches, better landings, smoother airwork

(5) Is there any noticeable difference in your familiarity with the aircraft and systems?

-- No (5)

-- Yes (17)

-- Yes, it has improved

-- Yes, more familiar

-- Yes, since I read the pilot's handbook for ½ hour prior to each flight

-- Yes, know more idiosyncracies

-- Yes, a little better

-- Much greater

-- Improved somewhat

-- Yes, improved

-- Not noticeable

-- Slight improvement

-- Little

-- Not really

-- Yes, a little

-- Yes, no doubt about it

-- Again, number of flights (starts, stops, etc.) makes more difference than hours

(6) Is there any noticeable difference in your knowledge and familiarity with aircraft procedures?

-- No, only have limited time to study procedures at NPS

-- Yes (17)

-- Slight

-- No/yes

-- Yes, much better

-- No (7)

-- Yes, a little

-- Not noticeable

-- Little

-- Yes, I am more familiar with T-1A procedures

-- Yes, improved

-- Improved somewhat

-- Much greater

-- Yes, better

-- Somewhat

-- Routine reinforcement rather than relearning

(7) Is there any noticeable difference in your knowledge and familiarity with ARTC/Radio procedures?

-- The biggest difference/improvement in this area

-- Slightly improved

-- Yes (11)

-- No (10)

-- Some

-- Better

-- Much greater

-- Not that I noticed

-- Improved somewhat

-- Yes, much improved

-- Not really, perhaps less, "small verbal errors."

-- No difference between 8 [hours/month] and 4 [hours/month]

-- Yes, a big plus here

-- Very definitely

-- Yes, better again

-- Yes, use them more often

-- Same as before

-- Yes, more hours arguing with [ARTC] Center helps

Comment: Resume of responses:

(1) Personal confidence

Yes - 32 = 86.5%

No - 5 = 13.5%

(2) Handling Marginal Weather

Yes - 28 = 82.4%

No - 6 = 17.6%

*3 aviators didn't answer this question.

(3) Attitude toward flying

Yes - 22 = 59.5%

No - 15 = 40.5%

(4) Mechanical Abilities

Yes - 24 = 65.0%

No - 13 = 35.0%

(5) Familiarity with Aircraft

Yes - 30 = 81.0%

No - 7 = 19.0%

(6) Familiarity with Procedures

Yes - 27 = 73.0%

No - 10 = 27.0%

(7) ARTC/Radio Procedures

Yes - 24 = 65.0%

No - 13 = 35.0%

Question #8L (8-hour group only)

Given the NPS aviator situation, do you feel that 8-hours per month maintains your flying skills and confidence sufficiently to affect your attitude and preparedness toward returning to operational flying?

-- I believe it depends on pilot experience. Young aviators should get 20 hours per month and "old" ones nothing. I would say 2500 hours experience divides young and old

-- No (2)

-- Yes (14)

-- Yes, in comparison, but still not enough for proper comparison

-- Yes, very definitely

-- Better than 4-hours; it should be increased (still more)

-- Still want to go thru Instrument RAG just as though I hadn't been flying

-- 8-hours not needed

-- No, because we are not maintaining any proficiency in combat type aircraft or maneuvers but rather in basic motor skills and instrument flight only

-- No. Eight hours still isn't enough. I've done it before

-- Marginally

-- Eight hours per month would better prepare a pilot for RAG work

-- Yes, but 6-hours (3 every other week) would do the same thing and would not interfere so much with studies

-- Flying here makes me desire to return to the fleet; good aircraft, challenging flying

-- In a good aircraft, yes - as is now, no

-- Yes, since flying skills and confidence are improved I would be able to transition with less trouble

-- Eight hours is better than 4 but 20 hours/ month is what a pilot needs to remain truly "proficient" and "combat ready"

-- Yes, but you are asking the wrong guy, ask some Lt. with 1500 hours, not a Cdr. with 4500 hours

-- Flying skills (yes). Confidence in T-1A (no)

-- I would like to fly more, but 8-hours does the job

-- Perhaps yes, but scheduling has been erratic

-- No, I am gung-ho already

-- No, I do not, although it is better than not getting in the air at all. Going back through a RAG should take care of that

Comment: Frequency counts and percentage breakdown:

Yes - 30 = 81.0%

No - 7 = 19.0%

Question #8M (8-hour group only)

Do you feel that 8-hours per month would reduce, increase, or have no effect on your RAG retraining time?

-- Should reduce it in comparison to 4-hours/ month

-- Have no effect

-- Decrease (2)

-- No effect (12)

-- I believe it would reduce this time

-- No effect, must still learn the mission again!

-- Probably no effect

-- For me (a CDR) I think 8-hours versus 4-hours would have little effect on RAG retraining time but believe it would reduce time for J.O.'s [Junior Officers]

-- Reduce (4)

-- Slightly reduce (depends a lot on how many years on proficiency flying)

-- Compared to 4-hours, great mental effect, probably little actual effect

-- Again, given a suitable aircraft it would surely reduce retraining time especially in instruments

-- Eight-hours per month would better prepare a pilot for RAG work

-- Have little effect

-- It didn't effect it before. Now, I don't know

-- Absolutely none!

-- No effect: RAG training for 2nd/3rd tour aviators is concentrated on mission of particular aircraft

-- None, unless increased [CRT flying hours made available]

-- No effect on time but a great effect on ability and safety

-- No effect [but] without CRT you better give people a jet retraining cycle before RAG [retraining]

-- Reduce, since at least you won't have to refly unsatisfactory flights

-- Type aircraft so different, wouldn't make much difference

Comment: Frequency count and percentage breakdown.

Increase - 0.0%

Decrease - 12 = 32.4%

No effect - 25 = 67.6%

Question #8N (8-hour group only)

Would 4-hours per month reduce, increase, or have no effect on your RAG retraining time?

-- Would make me jumpy in IFR weather if only 4-hours allowed, would make RAG IFR program harder

-- No effect (12)

-- Increase (5)

-- Reduce slightly

-- Should increase your RAG time

-- Increase [because of] [Reduced ability]

-- No effect: RAG training for 2nd/3rd tour aviators is concentrated on mission of particular aircraft

-- Increase, 4-hours per month [only] means 2-hours of stick time

-- Absolutely none!

-- I don't know, but my confidence would certainly suffer; 8-hours a month is undesirable, but 4-hours a month is unsatisfactory

-- I can't say for sure, but I imagine a 4-hour pilot would require more time to build up his confidence level more than his mechanical skills

-- No effect, except possibly in instrument training

-- Given a suitable aircraft it would surely reduce retraining time, but 4-hours would effect retraining time to a lesser extent than 8-hours per month

-- In comparison to zero-hours it would reduce the time

-- Very slightly reduce

-- It might reduce it some

-- I suggest aviators in my category [CDR, 4500 total hours and no expected further operational flying] who probably will not be operational again get 4-hours maximum (more if they can) but J.O.'s going back to squadrons get 8-hours minimum

-- Probably no effect

-- Reduce it some; better than zero. I might at least be as good as some of the nuggets

-- Have no effect, but if you start talking of no flying for 2 years, that, I'm sure, would increase the training time

Comment: Frequency count and percentage breakdown.

Increase - 12 = 33.3%

Reduce - 6 = 16.7%

NoEffect - 18 = 50.0%

*1 aviator did not answer directly.

8. T-1A CRT Characteristics

Please indicate your opinion of the T-1A as a CRT aircraft.

4-hour Group

	Great	Good	OK	Poor	Lousy	N/A
1. Procedures						
a. Preflight	0.027	0.324	0.622	0.027	0.000	0.000
b. Engine start	0.054	0.378	0.568	0.000	0.000	0.000
c. Emergency	0.000	0.297	0.514	0.108	0.054	0.027
d. Post flight	0.027	0.270	0.595	0.108	0.000	0.000
2. Handling						
a. Taxi	0.000	0.081	0.270	0.352	0.297	0.000
b. Take-off	0.054	0.270	0.595	0.054	0.027	0.000
c. Instrument Flt-simulated/ Actual	0.108	0.297	0.356	0.216	0.027	0.000
d. Climb	0.000	0.162	0.487	0.352	0.000	0.000
e. Cruise	0.000	0.162	0.595	0.216	0.027	0.000
f. Descent	0.054	0.216	0.703	0.027	0.000	0.000
g. Approach	0.000	0.460	0.485	0.054	0.000	0.000
h. Landing	0.054	0.270	0.487	0.135	0.054	0.000
i. Slow flight	0.054	0.405	0.514	0.027	0.000	0.000
3. Safety						
a. Overall impression	0.000	0.189	0.514	0.270	0.270	0.000
b. Survival equipment	0.000	0.189	0.514	0.189	0.108	0.000
c. Escape system	0.027	0.270	0.432	0.243	0.028	0.000
d. Stall warning	0.108	0.297	0.540	0.054	0.000	0.000
e. Stall/spin recovery	0.243	0.378	0.352	0.027	0.000	0.000

	Great	Good	OK	Poor	Lousy	N/A
4. Navigation equipment	0.162	0.297	0.270	0.163	0.108	0.000
5. Endurance	0.000	0.000	0.081	0.405	0.514	0.000
6. Aerobatics	0.054	0.189	0.487	0.162	0.081	0.027
7. A/C flight limitations	0.000	0.108	0.622	0.216	0.027	0.027
8. Availability (maintenance)	0.000	0.135	0.460	0.297	0.108	0.000
9. Support away from home	0.000	0.055	0.405	0.270	0.270	0.000
10. A/C reliability	0.000	0.189	0.568	0.243	0.000	0.000
11. Comfort	0.000	0.000	0.243	0.541	0.216	0.000
12. Convenience	0.027	0.108	0.460	0.324	0.081	0.000
13. How good is the A/C as a CRT A/C?	0.000	0.189	0.460	0.324	0.027	0.000

8-hour Group

	Great	Good	OK	Poor	Lousy	N/A
1. Procedures						
a. Preflight	0.054	0.432	0.460	0.054	0.000	0.000
b. Engine start	0.054	0.432	0.433	0.027	0.054	0.000
c. Emergency	0.054	0.297	0.460	0.162	0.027	0.000
d. Post flight	0.027	0.297	0.514	0.135	0.027	0.000
2. Handling						
a. Taxi	0.027	0.027	0.162	0.487	0.297	0.000
b. Take-off	0.081	0.243	0.622	0.027	0.027	0.000
c. Instrument Flt-simulated Actual	0.081	0.297	0.298	0.243	0.081	0.000
d. Climb	0.000	0.162	0.568	0.216	0.054	0.000

	Great	Good	OK	Poor	Lousy	N/A
e. Cruise	0.000	0.135	0.487	0.243	0.135	0.000
f. Descent	0.027	0.189	0.595	0.189	0.000	0.000
g. Approach	0.054	0.324	0.487	0.081	0.054	0.000
h. Landing	0.054	0.270	0.379	0.162	0.135	0.000
i. Slow flight	0.108	0.243	0.541	0.108	0.000	0.000
3. Safety						
a. Overall impression	0.000	0.270	0.379	0.243	0.108	0.000
b. Survival equipment	0.000	0.081	0.622	0.216	0.081	0.000
c. Escape system	0.054	0.162	0.514	0.135	0.135	0.000
d. Stall warning	0.081	0.379	0.460	0.027	0.027	0.026
e. Stall/spin recovery	0.297	0.324	0.325	0.000	0.000	0.054
4. Navigation equipment	0.189	0.324	0.190	0.108	0.189	0.000
5. Endurance	0.000	0.000	0.081	0.297	0.622	0.000
6. Aerobatics	0.054	0.189	0.460	0.243	0.054	0.000
7. A/C flight limitations	0.027	0.108	0.541	0.270	0.054	0.000
8. Availability (maintenance)	0.000	0.108	0.325	0.297	0.279	0.000
9. Support away from home	0.054	0.108	0.271	0.297	0.243	0.027
10. A/C reliability	0.027	0.135	0.379	0.297	0.162	0.000
11. Comfort	0.000	0.054	0.216	0.487	0.243	0.000
12. Convenience	0.027	0.054	0.433	0.297	0.189	0.000
13. How good is the A/C as a CRT A/C?	0.027	0.162	0.352	0.243	0.216	0.000

C. THE SYSTEMS AND PROCEDURES EXAMINATION

Both the 8-hour per month group and a random sample from the 4-hour per month group completed the examination. The examination itself was intended to test the knowledge of each aviator of the aircraft, reference [3] and some general items of aviation knowledge and safety.

The Aircraft Servicing section of questions tested familiarity with kinds of fuel and oil needed to service the T-1A aircraft. Although the NATOPS Kneeboard Flip Pad contains the answers to the questions, the information required by these questions should be common knowledge. It is reasonable to expect some expertise in aircraft servicing when emergency landings at unfamiliar airfields are not uncommon.

The aircraft operating limitations questions are numbers which would necessarily be known for an aviator to determine if engine and aircraft systems are operating correctly and within limits. Other questions within this section, e.g. the maximum recommended gross weight for field landing is, relate to preflight planning and determination of capabilities while airborne. Since a finite number of T-1A aviators perform occasional aerobatic practice, it would be reasonable to expect a more than cursory knowledge of aircraft airspeed and structural limitations.

The questions contained in the Shore Based Procedures sections should be common knowledge to any aviator who has

than a casual acquaintance with the flight manual, flip pad, and who flies the aircraft whenever possible.

The Flight Procedures and Characteristics section of the examination tested the thoroughness of an aviator's knowledge and familiarity with the T-1A. Some of the questions were applicable to any aircraft, not just the T-1A.

It was felt that the emergency procedures section would touch on major malfunctions which could occur to all primary aircraft systems. Immediacy of pilot response to the malfunction was also part of the criteria for choosing the emergencies considered. A dutifully prepared aviator would as a matter of confidence and professionalism, know the remedial procedures for immediate action emergencies better, and more thoroughly, than those requiring a lesser and more calculated pilot response.

The results of the examination are presented in Table A. Question number III.4 was discarded because of a typographical error. The maximum possible score on the examination was 39.

TABLE A

SYSTEM AND PROCEDURES EXAMINATION SCORES

4-hour Group			8-hour Group		
13	21	23	16	23	26
17	21	23	16	23	26
18	22	24	17	23	27
18	22	24	17	23	28
18	22	24	20	23	28
18	22	25	21	23	29
19	22	25	22	24	30
20	22	26	22	24	30
20	22	27	23	24	30
20	22	29	23	25	32
20	23	30	23	25	33
20	23	Mean: 21.838	23	25	Mean: 24.189
20	23		23	25	

1. Analysis of Results

TREATMENT MEANS IN RANKED ORDER

	Rank	Label	Mean	Number of Replications	Treatment Number
4-hour	1	2	21.838	37	2
8-hour	2	1	24.189	37	1

The analysis performed on the examination scores yielded the following.

ANALYSIS OF VARIANCE

	Sum of Squares	DF	Mean Square	F Ratio
Between Groups	102.2835	1	102.2835	7.4186*
Within Groups	992.6960	72	13.7874	
Total	1094.9795	73		

*Significant for any $\alpha > 0.05$.

COMPUTED RANGES FOR ALPHA = 0.05
(Duncan's New Multiple Range Rest)

No. of Groups in Subset	Range
2	2.8218

There are no homogeneous subsets - any two means differ significantly. Hence, significant difference does exist between the two groups in overall examination scores in which the 8-hour group achieved significantly higher scores than the 4-hour group.

TABLE B

FREQUENCY OF INCORRECT EXAMINATION QUESTION ANSWERS

Section & Question No.	X 4-hr. Group	Y 8-hr. Group	X - Y Difference	Mean Diff.
I. Aircraft Servicing				
1.	7	7	0	-3.0
2.	20	14	-6	
II. Operating Limits				
1.	18	17	-1	-4.8
2.	14	9	-5	
3.	20	11	-9	
4.	16	15	-1	
5.	13	5	-8	
6.	19	20	1	
7.	18	6	-12	
8.	22	17	-5	
9.	14	9	-5	
10.	33	30	-3	
III. Shore Based Procedures				
1.	26	17	-9	-4.5
2.	27	20	-7	
3.	21	16	-5	
4.	-------	Omitted	-------	
5.	11	10	-1	
6.	17	9	-8	
7.	11	14	3	
8.	19	7	-12	
9.	1	4	3	
IV. Flight Characteristics				
1.	15	12	-3	-6.0
2.	31	22	-9	
3.	14	14	0	
4.	26	14	-12	
V. Emergency Procedures				
1.	3	3	0	-2.07
2.	19	12	-7	
3.	11	11	0	
4.	14	14	0	
5.	3	2	-1	
6.	27	24	-3	
7.	5	5	0	
8.	6	9	3	
9.	7	1	-6	
10.	17	11	-6	
11.	4	7	3	
12.	9	5	-4	
13.	19	11	-8	
14.	13	13	0	
15.	30	28	-2	

2. Comparison of Scores

A further comparison was made of the frequency with which questions were answered incorrectly. Table B is a listing of the data and the results of that comparison.

Notice that the overall mean difference = -145/39 = -3.72. The 4-hour group consistently missed more than the 8-hour group in all areas except Emergency Procedures where the mean differential in incorrect answer frequency was -2.67. All other areas, the mean difference is greater than the overall mean differential.

A One-way Analysis of Variance was performed on the frequencies listed in Table B with the following results.

ANALYSIS OF VARIANCE

	Sum of Squares	DF	Mean Square	F Ratio
Between Groups	269.5513	1	269.5513	4.7872*
Within Groups	4279.3242	76.	56.3069	
Total	4548.8750	77.		

*Significant for $\alpha > 0.025$.

TREATMENT MEANS IN RANKED ORDER

	Rank	Label	Mean	Number of Replications	Treatment Number
8-hour	1	2	12.179	39.	2
4-hour	2	1	15.897	39.	1

COMPUTED RANGES FOR ALPHA = 0.05
(Duncan's New Multiple Range Test)

No. of Groups in Subset	Range
2	2.8194

There are no homogeneous subsets - any two means differ significantly. Hence, as would be expected, the frequency with which a given question was answered incorrectly by the 4-hour was significantly higher than for the 8-hour group

3. Comparison of Incorrect Response Subject Areas

Questions and areas where largest divergence in numbers missed occurred, considering the 4-hour group missing 8 or more than the 8-hour group as minimum difference are noted as follows.

II. Aircraft Operating Limitations

3. The NATOPS Flight Manual Maximum IAS for full flaps and/or landing gear extended: (215 kts.).

5. Normal ground idle RPM setting is: (38 ± 1% RPM).

7. The maximum recommended aircraft gross weight for field landing is: (14,500 lbs.).

III. Shore Based Procedures

1. On preflight the nosewheel strut extension limits are the same as for the main gear struts? (True).

6. Optimal normal landing approach airspeed and angle-of-attack are: (20 units and 110 kts. + 4 kts. per 1,000 lbs. of fuel).

8. The average basic weight for the T-1A is: (11,100 lbs.)

IV. Flight Procedures and Characteristics

2. Use of aileron against a spin will have what effect: (Aid in recovery).

4. Operating in the 15,000-35,000 ft. m.s.l. altitude block, the compressibility effect is evidenced by: (Low vibration in seat and cockpit area at speeds in 0.76-0.79 IMN region).

V. Emergency Procedures

13. If both wing tank boost pump failure lights illuminate, sufficient fuel pressure can be maintained by the engine driven fuel booster pump to support Military thrust below an altitude of: (22,500 ft.).

Considering 6 or more as minimum difference, the following questions are added to the foregoing list:

I. Aircraft Servicing

2. Which of the pressures noted below is the maximum refueling pressure beyond which the aircraft fuel system will be damaged? (60 psi).

III. Shore Based Procedures

2. Minimum oil quantity on preflight is: (8.5 qts.).

V. Emergency Procedures

9. Before ejection, where should the feet be placed? (On rudder pedals).

10. Given that a complete electrical failure has occurred, the fuel flow gauge, exhaust temperature indicators, and RPM gauge are self-generating instruments and will continue to operate as long as the engine is running? (False)

The number of questions and areas where the 4-hour group missed less than the 8-hour group considering only more than 1 (i.e. 3) less, are as follows:

III. Shore Based Procedures

7. The recommended technique for drift correction when landing in a strong crosswind is: (Both upwind-wing-low (slip) and Crab).

9. On shut-down, at what EGT and RPM, respectively, should impingement air be applied to blowout the engine (local policy only)? (200° and 10% RPM).

V. Emergency Procedures

8. Maximum altitude for an attempted airstart is: (20,000 ft. m.s.l.).

11. If the cause of a high loadmeter reading cannot be corrected, landing as soon as possible is not necessarily required: (False).

An analysis of the section of the examination most prevalently occurring in the foregoing list yields the following frequencies:

Section I. - 1

Section II. - 3

Section III. - 4

Section IV. - 2

Section V. - 3

The 4-hour group was less knowledgeable in all the areas. Those areas which were mentioned 3 or more times were aircraft operating limitations, shore based procedures, and emergency procedures.

D. DATA FLIGHTS

The airborne collection of data in the form of data flights began on 16 November and ended 30 December 1970. A total of 68 aviators flew data flights. All 37 members of the 8-hour group flew and 31 of the 4-hour group flew. The weather at Monterey during this time frame was consistently rainy with low cloud cover and some fog. Therefore, considerable difficulty was encountered in launching the data flights because of the no-fly restriction on the T-1A when raining.

It had been planned that the data flights would be completed before final examination week and the holidays, but it didn't work out that way. Again, difficulty was encountered in scheduling data pilots and recorders during examinations and later during the holiday leave period. The data collection form utilized is precisely the same as that used on the first data collection. The form itself is presented in reference [7] as Appendix C. Even though the data recorders were kept quite busy in filling out the form on a lap, it was not necessary to alter the format in any respect nor to change the data collection procedures.

The final examination period extended from 11 December until 18 December 1970 and a scheduled leave period followed the examination week lasting until 4 January 1971. No regularly scheduled flight operations are conducted during examination week nor during the holidays. A system of

voluntary sign-up for flights is provided during such time periods.

Data flights were conducted during both daytime and night. The flight itself was identical to that described in reference [7], the First Interim Report. NAS Lemoore was the primary enroute base for a TACAN approach and GCA final. Data pilots flew a filed IFR flight plan to Lemoore. Following a GCA at Lemoore, data pilots executed a missed approach and climbout for return to Monterey. The return leg to Monterey was either IFR or VFR at the discretion of the data pilot. The approach and landing at Monterey was also the choice of the data pilot, considering the weather.

1. Data Pilots

The members of the 8-hour per month were selected using random number tables in reference [5], from the original group of 96 aviators described in reference [7]. The members of the 4-hour per month group were also chosen using random number tables.

A breakdown of the sample by rank is as follows:

Rank	Number	%
Commander, USN	16	23.6
Major, USMC	1	1.5
Lieutenant Commander, USN	20	29.4
Lieutenant, USN	29	42.7
Captain, USMC	2	2.8

A further breakdown by total flying hours, a measure of total flying experience, is as follows in Table C, a

histogram. The frequency counts include the upper endpoint and exclude the lower.

TABLE C
TOTAL FLIGHT HOURS BREAKDOWN

Hours Flown	Number of Pilots
0 - 500	0
500 - 1000	4
1000 - 1500	19
1500 - 2000	7
2000 - 2500	9
2500 - 3000	5
3000 - 3500	14
3500 - 4000	3
4000 - 4500	5
4500 - 5000	1
5000 - 5500	1
5500 +	0
Total	68

It is noteworthy that 32.4% of the total sample have 1500 or less total flight hours, and 57.4% 2500 or less total flight hours. These are the two groups previously mentioned in the questionnaire responses as being those aviators essentially still learning about flying, who are most needy of flying experience. It would seem that a two or more year hiatus in flying experience for these groups could set them behind their contemporaries and as an upper extreme, be fatal.

During the time frame which commenced with the first data flight and terminating with the last data flight, the following mean flying ratio were experienced by each group.

Since the occurrence of the data flight itself was essentially random, a standard 30-day month was assumed, and is not related necessarily to a calendar month.

TABLE D
LISTING OR MEAN FLYING ACTIVITY

	8-hour Group	4-hour Group
Mean No. flying opportunities	13.14	7.48
Mean No. flights per standard month	8.20	4.48
Mean No. flight hours per opportunity	2.76	2.58
Mean Total hours for period	34.45	19.24
Mean time between flying opportunities	9.72	17.76

2. Analysis of Data Flight Scores

The primary tools in the analysis of data flight scores was the one-way analysis of variance (parametric) and the Duncan Revised Multiple Range Test ($\alpha = 0.05$). In all cases normality was assumed through the applicability of the Central Limit Theorem. References [1], [2], [4] and [6] apply. In several instances, as a cross-check of the Duncan Test, a two sample T-test from reference [4] was also utilized. The analysis began with comparison of raw scores and was refined in terms of normalized scores.

The comparison of the raw data flight scores of the whole second data flight collection versus the first data flight collection from July 1970 yielded the following.

ANALYSIS OF VARIANCE

	Sum of Squares	DF	Mean Square	F Ratio
Between Groups	482.4998	1	482.4998	0.9900*
Within Groups	78953.7500	162.	487.3687	
Total	79436.1875	163.		

*Not significant for any $\alpha < 0.75$.

Hence, there is no significant difference between the first and second data flight scores overall.

TREATMENT MEANS IN RANKED ORDER

	Rank	Label	Mean	Number of Replications	Treatment Number
First data set	1	1	32.813	96.	1
Second data set	2	2	36.294	68.	2

COMPUTED RANGES FOR ALPHA = 0.05
(Duncan's New Multiple Range Test)

No. of Groups in Subset	Range
2	2.7974

There are 1 homogeneous subsets:

(1 , 2)

Notice that the mean of the second set of scores is higher than the mean of the first set of scores. Any significance which may exist between the two sets is lost since the standard deviations of both are so relatively large, in a distributional sense. The difference in means is also not significant and is essentially random.

The next comparative analysis was concerned with the second raw data flight scores, 4-hour versus 8-hour groups. Such comparison yielded the following:

ANALYSIS OF VARIANCE

	Sum of Squares	DF	Mean Square	F Ratio
Between Groups	973.1111	1	973.1111	1.6625*
Within Groups	38632.8789	66.	585.3464	
Total	39605.9883	67.		

*Not significant for any $\alpha < 0.23$.

Hence, there is no significant difference between the 4-hour and 8-hour groups.

TREATMENT MEANS IN RANKED ORDER

	Rank	Label	Mean	Number of Replications	Treatment Number
4-hour Group	1	1	32.161	31.	1
8-hour Group	2	2	39.757	37.	2

COMPUTED RANGES FOR ALPHA = 0.05
(Duncan's New Multiple Range Test)

No. of Groups in Subset	Range
2	2.8259

There are 1 homogeneous subsets:

(1 , 2)

Again, there is noticeable difference in the mean scores, but the magnitude of the standard deviations precludes any statistically significant differences.

3. Analysis After Minor Deletions

A series of deletions were devised to cull out those aviators of either group who had not flown at all during one calendar month or who had supplimented their flying time in aircraft types different from the T-1A. Again, the study time frame remains the same, i.e. first through second data flights. As can be seen, the 4-hour group was reduced to 20 aviators and the 8-hour group to 27 aviators. The results of the comparison is noted below, both individually by group and in aggregate.

4-hour Group. A comparison of first versus second data flight scores yielded the following.

ANALYSIS OF VARIANCE

	Sum of Squares	DF	Mean Square	F Ratio
Between Groups	87.0248	1	87.0248	0.1885*
Within Groups	17540.2891	38.	461.5864	
Total	17627.3125	39.		

*Not significant for $\alpha < 0.63$.

TREATMENT MEANS IN RANKED ORDER

	Rank	Label	Mean	Number of Replications	Treatment Number
Second data set	1	2	31.150	20.	2
First data set	2	1	34.100	20.	1

COMPUTED RANGES FOR ALPHA = 0.05
(Duncan's New Multiple Range Test)

No. of Groups in Subset	Range
2	2.8627

There are 1 homogeneous subsets:

(2 , 1)

Again, no significant difference is noted. It would seem that an occasional zero flight hour month, or exploiting a passing opportunity to fly a fleet type of operational aircraft would have no effect on aviator skill as measured in this study, for a 4-hour per month pilot, even though a reduction in mean score can be seen.

8-hour Group. A comparison of first versus second data flight scores yielded the following.

ANALYSIS OF VARIANCE

	Sum of Squares	DF	Mean Square	F Ratio
Between Groups	4.7407	1	4.7407	0.0138*
Within Groups	17885.1875	52.	343.9458	
Total	17889.9258	53.		

*Not significant for $\alpha < 0.75$.

TREATMENT MEANS IN RANKED ORDER

	Rank	Label	Mean	Number of Replications	Treatment Number
Second data set	1	2	42.370	27.	2
First Data set	2	1	42.963	27.	1

COMPUTED RANGES FOR ALPHA = 0.05
(Duncan's New Multiple Range Test)

No. of Groups in Subset	Range
2	2.8391

There are 1 homogeneous subsets:

(2 , 1)

As with the 4-hour group, no significant difference is noted.

4-hour versus 8-hour Group. A comparison of first data flight scores after deleting the zero-month aviators and those who flew different types of aircraft yielded:

ANALYSIS OF VARIANCE

	Sum of Squares	DF	Mean Square	F Ratio
Between Groups	1446.4714	1	1446.4714	4.3196*
Within Groups	15068.7891	45.	334.8618	
Total	16515.2578	46.		

*Significant for any $\alpha > 0.025$.

TREATMENT MEANS IN RANKED ORDER

	Rank	Label	Mean	Number of Replications	Treatment Number
First data set	1	1	31.150	20.	1
Second data set	2	2	42.370	27.	2

COMPUTED RANGES FOR ALPHA = 0.05
(Duncan's New Multiple Range Test)

No. of Groups in Subset	Range
2	2.8490

There are no homogeneous subsets - any two means differ significantly. Hence, the deletions provided a significant difference in first data flight scores, reflecting, it would seem, a certain amount of serendipity.

4-hour versus 8-hour Group. A comparison of second data flight scores, with the same deletions as above:

ANALYSIS OF VARIANCE

	Sum of Squares	DF	Mean Square	F Ratio
Between Groups	902.5129	1	902.5129	1.9951*
Within Groups	20356.6914	45.	452.3708	
Total	21259.2031	46.		

*Not significant for any $\alpha < 0.19$.

TREATMENT MEANS IN RANKED ORDER

	Rank	Label	Mean	Number of Replications	Treatment Number
First data set	1	1	34.100	20.	1
Second data set	2	2	42.963	27.	2

COMPUTED RANGES FOR ALPHA = 0.05
(Duncan's New Multiple Range Test)

No. of Groups in Subset	Range
2	2.8490

There are 1 homogeneous subsets:

(1 , 2)

Thus, a marginally significant difference in variances is noted by the F-test, but no significant difference in means is apparent, at the $\alpha = 0.05$ level.

A further incidental comparison of changes in data flight scores, first to second data flights, 4-hour versus 8-hour group with the above explained deletions, yielded the following.

ANALYSIS OF VARIANCE

	Sum of Squares	DF	Mean Square	F Ratio
Between Groups	3.0670	1	3.0670	0.0043*
Within Groups	31960.4844	45.	710.2329	
Total	31963.5508	46.		

*Not significant for $\alpha < 0.75$.

TREATMENT MEANS IN RANKED ORDER

	Rank	Label	Mean	Number of Replications	Treatment Number
8-hour Group	1	2	1.333	27.	2
4-hour Group	2	1	1.850	20.	1

COMPUTED RANGES FOR ALPHA = 0.05
(Duncan's New Multiple Range Test)

No. of Groups in Subset	Range
2	2.8490

There are 1 homogeneous subsets:

(2 , 1)

Thus, there is no significant difference in the changes in data flight scores. Continuing the incidental comparisons, the following is a comparison of flight hours per month for the two groups, after deletions.

ANALYSIS OF VARIANCE

	Sum of Squares	DF	Mean Square	F Ratio
Between Groups	172.0437	1	172.0437	183.4350*
Within Groups	42.2055	45.	0.9379	
Total				

*Significant for any $\alpha > 0.0$

TREATMENT MEANS IN RANKED ORDER

	Rank	Label	Mean	Number of Replications	Treatment Number
First data set	1	1	4.428	20.	1
Second data set	2	2	8.298	27.	2

COMPUTED RANGES FOR ALPHA = 0.05

No. of Groups in Subset	Range
2	2.8490

There are no homogeneous subsets - any two means differ significantly.

This incidental analysis confirms that the 4-hour group and 8-hour group flew at least the required number of hours per month in the T-1A.

4. Analysis After Major Deletions

Further deletions from the two samples were rade in addition to those explained above. Such deletions were data recorder oriented and excluded the scores received by data pilots from data recorders who were consistently too easy

in grading and those who were consistently too difficult. The 4-hour group was thereby reduced to 19 members, and the 8-hour group was reduced to 24 members.

4-hour Group. A comparison of first and second data flight scores.

ANALYSIS OF VARIANCE

	Sum of Squares	DF	Mean Square	F Ratio
Between Groups	36.0264	1	36.0264	0.0883*
Within Groups	14686.9063	36.	407.9695	
Total	14722.9297	37.		

*Not significant for $\alpha < 0.75$.

TREATMENT MEANS IN RANKED ORDER

	Rank	Label	Mean	Number of Replications	Treatment Number
8-hour Group	1	2	29.053	19.	2
4-hour Group	2	1	31.000	19.	1

COMPUTED RANGES FOR ALPHA = 0.05
(Duncan's New Multiple Range Test)

No. of Groups in Subset	Range
2	2.8676

There are 1 homogeneous subsets:

(2 , 1)

Thus, no significant difference has been found as a result of the major deletions in terms of mean or variance, between first and second data flight scores.

8-hour Group. A comparison of first versus second data flight scores considering major deletions.

ANALYSIS OF VARIANCE

	Sum of Squares	DF	Mean Square	F Ratio
Between Groups	75.6738	1	75.6738	0.1866*
Within Groups	17845.4023	44.	405.5771	
Total	17921.0742	45.		

*Not significant for any $\alpha < 0.75$.

TREATMENT MEANS IN RANKED ORDER

	Rank	Label	Mean	Number of Replications	Treatment Number
4-hour Group	1	1	40.130	23.	1
8-hour Group	2	2	42.696	23.	2

COMPUTED RANGES FOR ALPHA = 0.05
(Duncan's New Multiple Range Test)

No. of Groups in Subset	Range
2	2.8507

There are 1 homogeneous subsets:

(1 , 2)

4-hour versus 8-hour Group. A comparison of second data flight scores with major deletions yielded the following.

ANALYSIS OF VARIANCE

	Sum of Squares	DF	Mean Square	F Ratio
Between Groups	1132.3396	1	1132.3396	2.7501*
Within Groups	16881.3164	41.	411.7393	
Total				

*Not significant for any $\alpha < 0.15$.

TREATMENT MEANS IN RANKED ORDER

	Rank	Label	Mean	Number of Replications	Treatment Number
8-hour Group	1	2	31.000	19.	2
4-hour Group	2	1	41.333	24.	1

COMPUTED RANGES FOR ALPHA = 0.05
(Duncan's New Multiple Range Test)

No. of Groups in Subset	Range
2	2.8562

There are 1 homogeneous subsets:

(2 , 1)

Thus, there is what can be considered as significant ($\alpha = 0.15$) differences between the 4-hour group and 8-hour group after deletions.

It was felt that any further deletions would invalidate the results of analysis. Therefore, no more deletions were attempted.

5. Data Recorders

An analysis of the grades assigned by the data recorders, as listed in Table E,

was considered appropriate and was prompted by the results of the foregoing analysis and the large variances encountered.

Comparison of Data Recorder Scoring. A comparison of the grades assigned by data recorders, first versus second data collections using mean scores assigned by each man.

ANALYSIS OF VARIANCE

	Sum of Squares	DF	Mean Square	F Ratio
Between Groups	134.0952	1	134.0952	0.3086*
Within Groups	19986.3398	46.	434.4856	
Total	20120.4336	47.		

*Not significant for any $\alpha < 0.63$.

TREATMENT MEANS IN RANKED ORDER

	Rank	Label	Mean	Number of Peplications	Treatment Number
First data set	1	1	33.471	25.	1
Second data set	2	2	36.816	23.	2

COMPUTED RANGES FOR ALPHA = 0.05
(Duncan's New Multiple Range Test)

No. of Groups in Subset	Range
2	2.8474

There is 1 homogeneous subset:

(1 , 2)

Thus, there is no significant difference in the mean scores assigned by the data recorders between the two collection periods. As an aside, only 23 data recorders were

TABLE E

DATA RECORDER SCORING PATTERNS

	1st Data Collection						2nd Data Collection					
Recorder	Scores					Mean	Scores					Mean
1.	16	27	16			19.67	10	38	51			49.50
2.	19	27	36			27.33	-1	16	19	10	25	13.80
3.	12	26	21	8	21	21.29	None					-
	21	45	16									
4.	35	31	38			34.67	41	21	52			38.00
5.	32	68	47	31	61	46.70	71	62	65	36		58.50
6.	91	50				74.50	45					45.00
7.	32	21	20	11	11	19.33	23					23.00
	21											
8.	21	33	18			24.00	11	2				6.50
9.	57	51	59	45	50	52.40	48	60				54.00
10.	19	22	33	19	29	29.17	7	19	39			21.67
	53											
11.	55	37	33	42		41.75	76	56	60	52	38	57.14
							55	63				
12.	27	20	11	15	19	19.00	26					26.00
	22											
13.	18	26	-5			13.67	8	26				17.00
14.	33	46	24			34.33	50	36	49			67.50
15.	24	11	32			22.33	13	25				19.00
16.	36	25	30	21	36	27.83	16	16	12	16	18	24.00
	19						18					
17.	67	62	62	64	54	61.80	77	77	81			78.33
18.	64	44	64	51		55.75	75	56	63	60		63.50
19.	6	-7	-34	-15		-12.50	-19	34				7.50
20.	37	52				44.50	None					-
21.	44	50	45	50		47.25	48	50	52			52.00
22.	45	61				53.00	63	34	38	67		67.33
23.	18					18.00	9	19	-2			8.67
24.	15	69	57			47.00	63	20				41.50
25.	20	8				14.00	-5	-4	31			7.33

used on the second data collection since one was injured in an ejection and the other had all of his scheduled hops cancelled for various reasons.

Second Data Collection. A comparison of mean scores assigned by data recorders to the 4-hour group versus 8-hour group. This analysis was prompted by the animosity demonstrated by some pilots and data recorders toward the second data collection of the study:

ANALYSIS OF VARIANCE

	Sum of Squares	DF	Mean Square	F Ratio
Between Groups	7718.8750	1	7718.8750	1.5650*
Within Groups	172630.0000	35.	4932.2852	
Total	180348.8750	36.		

*Not significant for $\alpha < 0.19$.

TREATMENT MEANS IN RANKED ORDER

	Rank	Label	Mean	Number of Replications	Treatment Number
First data set	1	1	29.059	17.	1
Second data set	2	2	58.041	20.	2

COMPUTED RANGES FOR ALPHA = 0.05
(Duncan's New Multiple Range Test)

No. of Groups in Subset	Range
2	2.8703

There is 1 homogeneous subset:

(1 , 2)

Thus, it can be considered that no significant difference exists in the mean scores assigned the 4-hour group versus

8-hour group. Some significant difference with $\alpha > 0.19$ can be considered to exist between the variances of the two samples.

6. Aggregated Category Scores

A listing of the individual and aggregated scores by major heading/category on the data flight kneeboard check pad is enclosed in Appendices E and F. The range of possible scores on any one data flight is +94 to -94. The range on the second data collection ran from -19 to +81.

The comparisons of this section involve only the aggregated category scores of Appendices E and F, as normalized by the maximum possible score under each heading. In the first analysis, all categories are considered, whereas on a later analysis only those categories which considered actual aircraft operation were considered. The following results were achieved through comparing the 4-hour versus the 8-hour groups.

ANALYSIS OF VARIANCE

	Sum of Squares	DF	Mean Square	F Ratio
Between Groups	4.9101	1	4.9101	1.6763*
Within Groups	193.3224	66.	2.9291	
Total	198.2324	67.		

*Not significant for $\alpha < 0.21$.

Thus, there is a marginally significant difference ($\alpha = 0.21$) in population variances.

TREATMENT MEANS IN RANKED ORDER

	Rank	Label	Mean	Number of Replications	Treatment Number
4-hour Group	1	1	2.283	31.	1
8-hour Group	2	2	2.822	37.	2

COMPUTED RANGES FOR ALPHA = 0.05
(Duncan's New Multiple Range Test)

No. of Groups in Subset	Range
2	2.8259

There is 1 homogeneous subset:

(1 , 2)

Although there is marginally significant difference in population variance, the means are not significantly different at the $\alpha = 0.05$ level.

Comparison of Flying Categories Only. The non-flying categories were Preflight and Other. After deleting those two categories, the following comparison of the 4-hour versus the 8-hour group was performed.

ANALYSIS OF VARIANCE

	Sum of Squares	DF	Mean Square	F Ratio
Between Groups	3.2658	1	3.2658	0.8891*
Within Groups	242.4295	66.	3.6732	
Total	245.6953	67.		

*Not significant for $\alpha < 0.32$.

TREATMENT MEANS IN RANKED ORDER

	Rank	Label	Mean	Number of Replications	Treatment Number
4-hour Group	1	1	2.683	31.	1
8-hour Group	2	2	3.123	37.	2

COMPUTED RANGES FOR ALPHA = 0.05
(Duncan's New Multiple Range Test)

No. of Groups in Subset	Range
2	2.8259

There is 1 homogeneous subset:

(1 , 2)

Thus, there is no significant difference between the two groups of normalized flying category scores.

Comparison of 4-hour Group. A comparison of average aggregated category scores for all categories is described as follows.

ANALYSIS OF VARIANCE

	Sum of Squares	DF	Mean Square	F Ratio
Between Groups	0.8316	5	0.1663	1.3798*
Within Groups	21.6953	180.	0.1205	
Total	22.5269	185.		

*Not significant for $\alpha < 0.22$.

TREATMENT MEANS IN RANKED ORDER

Rank	Label	Mean	Number of Replications	Treatment Number
1	6	0.266	31.	6
2	3	0.281	31.	3
3	4	0.370	31.	4
4	1	0.375	31.	1
5	5	0.402	31.	5
6	2	0.458	31.	2

COMPUTED RANGES FOR ALPHA = 0.05
(Duncan's New Multiple Range Test)

No. of Groups in Subset	Range
2	2.7955
3	2.9397
4	3.0307
5	3.1019
6	3.1621

There is 1 homogeneous subset:

(6 , 3 , 4 , 1 , 5 , 2)

Thus, there is no significant difference among the categories for the 4-hour group.

Comparison for the 8-hour Group. A comparison of average aggregated scores for all categories follows.

ANALYSIS OF VARIANCE

	Sum of Squares	DF	Mean Square	F Ratio
Between Groups	1.7915	5	0.3583	3.6576*
Within Groups	21.0613	215.	0.0980	
Total	22.8528	220.		

* Significant for any $\alpha > .003$.

TREATMENT MEANS IN RANKED ORDER

Rank	Label	Mean	Number of Replications	Treatment Number
1	3	0.297	37.	3
2	6	0.340	36.	6
3	1	0.439	37.	1
4	5	0.444	37.	5
5	4	0.473	37.	4
6	2	0.574	37.	2

COMPUTED RANGES FOR ALPHA = 0.05
(Duncan's New Multiple Range Test)

No. of Groups in Subset	Range
2	2.7927
3	2.9367
4	3.0273
5	3.0987
6	3.1592

There are 4 homogeneous subsets:

(6 , 1 , 5 , 4)

(1 , 5 , 4 , 2)

(6 , 1 , 5 , 4)

(3 , 6 , 1 , 5)

Comparison from First Data Collection

The following analysis was performed on the first data flight category information.

ANALYSIS OF VARIANCE

	Sum of Squares	DF	Mean Square	F Ratio
Between Groups	5.7159	5	1.1432	11.7996*
Within Groups	55.1260	569.	0.0969	
Total	60.8418	574.		

*Significant for any $\alpha > 0.0$

TREATMENT MEANS IN RANKED ORDER

Rank	Label	Mean	Number of Replications	Treatment Number
1	3	0.177	96.	3
2	1	0.356	96.	1
3	4	0.385	96.	4
4	5	0.422	96.	5
5	2	0.469	96.	2
6	6	0.470	95.	6

COMPUTED RANGES FOR ALPHA = 0.05
(Duncan's New Multiple Range Test)

No. of Groups in Subset	Range
2	2.7838
3	2.9274
4	3.0164
5	3.0885
6	3.1498

There are 7 homogeneous subsets:

(1 , 4)

(4 , 5 , 2)

(1 , 4 , 5)

(4 , 5 , 2 , 6)

(1 , 4 , 5)

(4 , 5 , 2)

III. CONCLUSIONS

The following conclusions will be in discussion form, and will consider the elements of the study in sequence as considered in the body of the study.

A. THE QUESTIONNAIRE

There is unanimity of feeling by both groups of aviators in the inadequacy of flying four hours per month. Such a restriction in flying hours allows no flexibility in the missions flown by the proficiency pilot. Most aviators feel that aerobatics, formation flying, and FMLP's should be part and parcel to the proficiency flying if such flying is to be minimally effective in retaining mission skill capabilities for aviators. Again, at a rate of four hours per month, the night and instrument flying time minimums dominate and leave little opportunity to practice other required skills. Also, four hours per aviator allows little scheduling flexibility during the course of a month.

The T-1A aircraft is generally considered inadequate as a jet proficiency flying aircraft. The reasons given for such opinions are: (1) Endurance: one cannot stay aloft long enough on a single flight to allow flexibility in missions performed, (2) Comfort: the cockpit is too small, (3) Braking and Taxiing: the brakes in the T-1A are not in the least similar to the feel and effectiveness of operational fleet aircraft brakes in taxiing, braking to a stop, and in maintaining aircraft directional control with brakes,

(4) no instrument hood is provided for simulated instrument practice, (5) the age of the aircraft and difficulty with navigation systems, (6) it provides no proficiency maintaining capability for the Naval Flight Officer whose specialty applies only to operating systems in fleet aircraft, (7) it is under-powered and its structural limits are not in consonance with fleet aircraft. It is also noteworthy that a greater number of aviators in the 4-hour group supplement their flying time in other aircraft and/or at other air stations than the 8-hour group.

Concerning 4-flight hours per month, there is a general feeling that it is not a sufficient number of flight hours to maintain mission skills, and more importantly, personal aviator confidence. Of the several choices among skill areas, both groups chose personal aviator confidence as the most important. It can then be concluded that an aircraft and situation which allows aviator confidence to deteriorate is unacceptable in proficiency maintenance. Four hours per month then qualifies as unacceptable.

The 8-hour group was emphatic in their opinion that the increased flying was noticeably effective in increasing confidence and skill proficiency as conscienciously felt by the aviators themselves. By the same token, interference with study requirements was noted among the 8-hour group, moreso than among the 4-hour group. Hence, a definite tradeoff of flying hours versus study hours exists at that level of flying activity. A third factor enters the tradeoff

dichotomy, that being time available for family and individual pursuits. Thus, the tradeoffs are three-way on the essential element - time. This fact alone leads the author to consider four hours per month an absolute minimum, and that aviators at NPS be allowed to fly more than four hours per month as time comes available to them, and not necessarily time for flight hours available in the form of dollars to NALF Monterey, Four hours per month is considered far better than no hours with flight pay intact by both groups. And, lastly, with 53% of the aviator population in the less than 2500 total flight hours category, elimination of flying or its restriction to a low level of activity, can be expected to reduce the rate of increase of learning about flying by this group. This fact, in turn, implies that the functioning of these aviators at a later time both as aviators and as flight leaders, is jeopardized.

Those aviators in the 8-hour group are of the opinion that the increase in proficiency flying activity will either have no effect or decrease their RCVW retraining time. But, the group felt that the four hours per month level of activity will have no effect or increase such retraining time.

Concerning the perceived usefulness of CRT flying and since the T-1A is being phased out, the data group provided a thorough insight into their feelings about the aircraft and kinds of missions that CRT flying should involve. Regarding the type or model of CRT aircraft, the aviators

feel that a CRT aircraft must resemble an operational fleet aircraft in all performance and capability respects commensurate with the reduction in flying hours. The CRT aircraft must be able to remain airborne for at least 2 hours. It must have an operating range capability similar to fleet aircraft. The aircraft must be able to perform aerobatics and must land, brake, and taxi with similar characteristics as a fleet aircraft. The similarity with fleet aircraft should also include such things as power, engine response, and landing technique.

Since instrument and night flying skills are emphasized in CRT by directive, it is necessary that an adequate instrument hood be provided. Also, a broad range of current and dependable navigation and instrument flying equipment should be available in the aircraft. Lastly, from some of the extreme comments regarding headroom, leg-room, cockpit space, and seat comfort, a hypothetically ideal CRT aircraft cockpit would be designed for the present day aviator and not the 1950 aviator as in the T-1A.

It is apparent that the NPS aviator does not expect a CRT aircraft to necessarily be an F4, A4, or similar fleet aircraft. Nonetheless, instrument and night flying are only a small part of the mission oriented skills that a Naval aviator must be able to perform. In fact, they are minimal.

Most experienced aviators realize that instrument flying ability is not necessarily indicative of general flying skill. The techniques of instrument flying are in no way

applicable to formation flying or ACM (air combat maneuvering). Aerobatics may be performed on the instruments but only to demonstrate what is termed "unusual attitudes" or in preparation for night carrier operations or night weapons delivery. But, instrument flying prepares nobody for visual aerobatics and especially ACM (air combat maneuvering). The required judgemental and reflex skills of ACM can never be duplicated or maintained by practicing instrument flying.

These facts have been brought home to the NPS aviator and thus he desires to practice other missions than instrument flying. As previously noted, those other missions include formation flying, aerobatics, ACM, and field carrier landing practice. Thus, it is reasonable to conclude that CRT aviators should be provided the opportunity to perform all the above missions in a current aircraft, with sufficient flying hours available in which to practice those missions. It is also reasonable to conclude that if an aviator is practiced in the mission oriented skills mentioned, in a current aircraft, that RCVW retraining costs in terms of time will be reduced.

B. THE SYSTEMS AND PROCEDURES EXAMINATION

It can be concluded that the 8-hour group is significantly more familiar and knowledgeable of the aircraft, its systems, its limitations and characteristics, procedures, and general aviation matters than the 4-hour per month group. This would be expected since the 8-hour group is in contact

with the aircraft, the NATOPS Flight Manual, and flying generally, than the 4-hour group. Again, it can be concluded that four hours per month is unacceptable and unsatisfactory, especially from an aviation safety point of view.

C. THE DATA FLIGHTS

Several items are noteworthy regarding the data flights which can provide some insight. It is apparent that no statistical significance can be found between the 4 and 8 hour groups. Nonetheless, that significance is lost due to the variance (dispersion) of the 4-hour group scores. In that fact lies a clue. From that clue it can be concluded that the 8-hour group is more consistent than the 4-hour group. Also, the mean scores attained by the 8-hour group are higher. The author is of the opinion that the 8-hour group is indeed more skillful than the 4-hour group.

Another factor which must be considered is the relatively limited duration that the 8-hour group in fact flew at a rate of eight-hours per month. It can be assumed that the 8-hour group skill level was beginning an upgrade when the second set of data was collected. Therefore, to show a difference in magnitude of mean score and variance after only a short stint at eight hours per month can intuitively be called marginally significant.

Lastly, a correlation and regression investigation was performed on the data from both data collections. The intent of that investigation was to find a multiple-regression equation which could be used for predictive

purposes, or to find a significant correlation among data flight grade and such items as total jet hours, time at NPS, T-1A hours, quiz grade, and mean time between flights. No significant correlation and no acceptable regression equation with small enough variance of residuals were found.

APPENDIX A

PILOT QUESTIONNAIRE
CRT STUDY

1. Name _____

2. File Number _____

3. 4-hours or 8 hours per month group, or data recorder? _____

4. Are you NATOPS qualified in the T-1A? _____

5. Do you fly the T-1A at NALF exclusively? _____

6. Do you fly at other air stations? _____

   If so, where and what type(s) of aircraft? _____

   How many hours per month on the average? _____

7. Please indicate your personal, subjective feelings about the T-1A with regard to:

   A. Confidence in the T-1A aircraft and systems _____

   B. Comfort of cockpit & seat _____

   C. Fun to fly _____

   D. How well flying the T-1A maintains your flying skills _____

8. Concerning CRT flying at NPS, answer all of the below listed questions:

   A. Does CRT flying interfere with your study time? _____

   B. Have your grades suffered through having to take time to fly? _____

C. Which would you prefer, 4-hours per month or no flying at all given that no other alternatives are possible? _____

_____

D. Do you prefer to accumulate your flying time on cross-countries or on the regular flying schedule? Why? _____

_____

E. What sort of hops in the T-1A do you usually fly? _____

_____

F. Short of actual weapons delivery or air combat maneuvering, what kinds of flights in the T-1A do you feel would help the most in maintaining your flight proficiency?

_____

_____

_____

G. Rank the following characteristics of aviator proficiency in order of importance; the most important would be given rank 1, and the least important would be given the highest number in the ranking.

_____. Personal aviator confidence

_____. Dexterity in mechanical skills and techniques

_____. Attitude toward flying.

_____. Accustomedness to G-loading, steep aircraft attitudes, and rapid rates of roll.

_____. Knowledge of ARTC procedures.

_____. Instrument flying ability.

_____. Personal satisfaction or sense of accomplishment.

H. If offered the opportunity to be excused from flying and still receive flight pay, would you request such excusal? Why?

_____

_____

_____

I. If you have not been excused from flying, and flying at Fritsche or NALF has been curtailed, would you partake of flying at, say, Moffett rather than be excused?

_____

J. If the answer to the preceding question was yes, would you prefer private or government transportation to and from flying? _____

K. (8-hour Group only) Compare 4-hours per month versus 8-hours per month with respect to:

(1) Personal confidence. Do you feel "safe" and capable of handling any situation without making a "silly" mistake or omission? _____

_____

(2) Do you consider yourself better suited to handle marginal weather conditions? _____

_____

(3) Does 8-hours versus 4-hours have any effect on your attitude toward flying? _____

_____

(4) Is there any noticeable difference in your mechanical flying abilities? _____

_____

(5) Is there any noticeable difference in your familiarity with the aircraft and systems? _____

_____

(6) Is there any noticeable difference in your knowledge and familiarity with aircraft procedures? _____

_____

(7) Is there any noticeable difference in your knowledge and familiarity with ARTC/Radio procedures? _____

_____

L. Given the NPS aviator situation, do you feel that 8-hours per month maintains your flying skills and confidence sufficiently to affect your attitude and preparedness toward returning to operational flying? _____

_____

M. Do you feel that 8-hours per month would reduce, increase, or have no effect on your RAG retraining time? _____

_____

N. Would 4-hours per month reduce, increase, or have no effect on your RAG retraining time? _____

_____

APPENDIX B

CRT STUDY
Systems and Procedures Exam

Name/Rank _____

File No. _____

4 or 8-hour Group _____

Instructions

1. Circle the correct answer and answer all questions.
2. If you cannot immediately answer a question, take a guess rather than wasting time.

I. Aircraft Servicing (Circle correct answer)

1. The coded classifications of fuel, engine oil, and hydraulic fluid required in servicing the T-A aircraft are:

   a. JP-4, 1011 Oil, Mil-H-5606 hydraulic fluid.

   b. JP-4, 1010 Oil, Mil-H-5604 hydraulic fluid.

   c. JP-4, 1010 Oil, Mil-H-5606 hydraulic fluid.

2. Which of the pressures noted below is the maximum refueling pressure beyond which the aircraft fuel system will be damaged?

   a. 50 psi.

   b. 60 psi.

   c. 70 psi.

II. Aircraft Operating Limitations. (Circle correct answer)

1. Best cruise RPM according to the NATOPS Flight Manual are:

   a. 85-95% RPM.

   b. 82-92% RPM.

   c. 84-93% RPM.

2. The range of permissible exhaust gas temperatures for continuous operation are:

   a. 255-708°C.
   b. 260-638°C.
   c. 850°C.
   d. 704°C.

3. The NATOPS Flight Manual maximum IAS for full flaps and/or landing gear extended is:

   a. 205 kts.
   b. 210 kts.
   c. 215 kts.
   d. 220 kts.

4. Maximum permissible hydraulic pressure is:

   a. 1750 psi.
   b. 1600 psi.
   c. 1500 psi.
   d. 1700 psi.

5. Normal ground idle RPM setting is:

   a. 35 ± 3% RPM.
   b. 38 ± 1% RPM.
   c. 40 ± 2% RPM.

6. Which airspeed listed below is the maximum beyone which damage to the canopy actuator mechanism may occur?

   a. 30 kts.
   b. 60 kts.
   c. 55 kts.
   d. 50 kts.

7. The maximum recommended aircraft gross weight for field landing is:

   a. 16,500 lbs.
   c. 14,500 lbs.
   b. 15,500 lbs.
   d. 14,000 lbs.

8. The NATOPS Flight Manual maximum airspeed for the T1A is:

   a. 505 kts. or 0.836 IMN, whichever is lower.

   b. 480 kts. or 0.78 IMN, whichever is lower.

   c. 550 kts. or 0.836 IMN, whichever is lower.

9. The limiting RPM above which engine removal is required if engine speed momentarily exceeds that limit is:

   a. 105% RPM.

   b. 103% RPM.

   c. 101.5% RPM.

10. When flying in conditions of moderate turbulence avoid deliberate accelerations in excess of:

   a. +2.0 g's.

   b. +4.0 g's.

   c. +4.5 g's.

   d. +3.5 g's.

III. Shore Based Procedures (Circle correct answer)

1. On preflight the nosewheel strut extension limits are the same as for the main gear struts?

   a. True.

   b. False.

2. Minimum oil quantity on preflight is:

   a. 7.0 quarts.

   b. 7.5 quarts.

   c. 8.0 quarts.

   d. 8.5 quarts.

3. Permissible fuel flow range on runup for take-off is:

   a. 5,000-6,000 lbs./hr.

   b. 5,500-6,500 lbs./hr.

   c. 6,000-7,000 lbs./hr.

   d. 5,250-6,250 lbs./hr.

4. On take-off, the NATOPS recommended airspeed for nosewheel rotation is:

   a. 75 kts.
   c. 95 kts.
   b. 215 kts.
   d. 110 kts.

5. The maximum range descent airspeed is:

   a. 190 kts.

   b. 215 kts.

   c. 140-165 kts.

   d. 175 kts.

6. Optimal normal landing approach airspeed and angle-of-attack are:

   a. 19 units and 110 kts. +5 kts. per 1,000 lbs. of fuel.

   b. 17.5 units and 115 kts. +4 kts. per 1,000 lbs. of fuel.

   c. 20 units and 110 kts. +4 kts. per 1,000 lbs. of fuel.

   d. 20 units and 115 kts. +5 kts. per 1,000 lbs. of fuel.

7. The recommended technique for drift correction when landing in a <u>strong</u> crosswind is:

   a. Upwind-wing-low (slip), only.

   b. Crab, only.

   c. Both.

   d. Neither.

8. The average basic weight for the T1A is:

   a. 12,500 lbs.

   b. 11,400 lbs.

   c. 11,100 lbs.

9. On shutdown at what ECT and RPM, respectively, should impingement air be applied to blowout the engine (local policy only)?

   a. 200° C and 15% RPM.

   b. 150° C and 10% RPM.

   c. 200° C and 10% RPM.

   d. 200° C and 0% RPM.

IV. Flight Procedures and Characteristics (Circle correct answer)

1. Concerning recovery from unusual attitudes, the NATOPS Flight Manual recommended recovery from a nose-high upright, low-airspeed condition with less than 160 kts. airspeed is:

   a. Push nose over maintaining zero g until nose is sufficiently below the horizon to gain airspeed then commence recovery to level flight.

   b. Apply full power, hold enough stick pressure to stay in seat, roll aircraft to 90-degrees of bank and let nose fall thru to gain airspeed, commence recovery.

2. Use of aileron against a spin will have what effect?

   a. Increase severity of the spin.

   b. Have no effect at all.

   c. Aid in recovery.

3. Concerning accelerated stalls in the T1A, the stall when applying G-load will be evidenced by:

   a. Medium to heavy buffet and a sudden increase in G-load.

   b. Moderate to light buffet and a sudden decrease in G-load and inability to retain G-load at which maneuver was entered.

   c. Medium to heavy buffet, a sudden decrease in G-load, and inability to retain G-load at which maneuver was entered.

4. Operating in the 15,000-35,000 ft. m.s.l. altitude block, compressibility effect is evidenced by:

   a. Low vibration in seat and cockpit area at speeds in the 0.76-0.79 IMN region.

   b. Buffet similar to stall onset in the 0.58-0.70 IMN region.

   c. Buffet similar to stall onset in the 0.76.0.79 IMN region.

V. Emergency Procedures (Circle correct answer)

1. If a fire warning light illuminates or there is other indication of fire during ground start, the NATOPS Flight Manual recommended first step in remedying the situation is:

   a. Ignition--OFF.

   b. Throttle--IDLE.

   c. Throttle--OFF.

2. If windmilling the engine after shutdown does not extinguish a residual afterfire, what procedure is recommended?

   a. Fuel Master--OFF, continue windmilling engine, remain in cockpit to monitor EGT.

   b. Fuel Master--OFF, continue windmilling the engine, and abandon aircraft.

   c. Fuel Master--OFF, abandon aircraft, terminate windmilling, and apply extinguishing agents as necessary.

3. Climbing at low airspeed and high engine RPM may cause the aft overheat warning light to illuminate.

   a. True.

   b. False.

4. The canopy can be jettisoned from any open position between full open to full closed.

   a. True.

   b. False.

5. When aborting with minimum amount of runway remaining and no abort or arresting gear available, the brakes should be used as much as possible,

   a. Without sliding the tires since rolling friction is more effective than sliding friction.

   b. With or without sliding since it makes no difference in stopping ability.

   c. As much as possible even if it involves blowing the tires.

6. Considering zero fuel, clean configuration with speed brakes up, the glide speed which will give greatest glide distance for least altitude loss is:

   a. 175 kts.

   b. 160-165 kts.

   c. 150 kts.

7. Abrupt throttle movement, or burst acceleration at low airspeeds, above 30,000 ft. m.s.l. may cause engine flameout.

   a. True.

   b. False.

8. Maximum altitude for an attempted airstart is:

   a. 30,000 ft. m.s.l.

   b. 35,000 ft. m.s.l.

   c. 27,500 ft. m.s.l.

   d. 20,000 ft. m.s.l.

9. Before ejection where should the feet be placed?

   a. on cockpit floor.

   b. On rudder peddles.

   c. It makes no difference.

10. Given that a complete electrical failure has occurred, the fuel flow gauge, exhaust temperature indicators, and RPM gauge are self generating instruments and will continue to operate as long as the engine is running.

    a. True.

    b. False.

11. If the cause of a high loadmaster reading cannot be corrected, landing as soon as possible is not necessarily required.

    a. True.

    b. False.

12. Given an AC power failure indicated by illumination of the instruments out warning light, if upon selecting STANDBY on the AC power control switch the instruments out light remains on, the aircraft should be landed as soon as possible.

    a. True.

    b. False.

13. If both wing tank boost pump failure lights illuminate sufficient fuel pressure can be maintained by the engine driven fuel booster pump to support Military thrust below an altitude of:

    a. 15,000 ft.

    b. 35,000 ft.

    c. 22,500 ft.

    d. 27,500 ft.

14. If hydraulic pressure loss is indicated, airspeed should be reduced to below:

    a. 215 kts.

    b. 200 kts.

    c. 175 kts.

15. The minimum acceptable airspeed on final in a precautionary approach is:

    a. 120 kts.

    b. 125 kts.

    c. 130 kts.

    d. 135 kts.

APPENDIX C

AVIATOR FLIGHT EVALUATION

2nd Data Collection
Flight Phase Scores

	Phases 4-hour Group																Totals			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	(+)	(-)	NET	AVE.
1	-	4	6	4	6	9	8	6	7	5	-	5	-	9	4	3	76	-	76	5.85
2	2	4	6	4	5	6	3	6	2	2	-	1	-	9	3	3	56	-	56	4.00
3	3	4	5	3	2	8	6	6	5	4	-	5	-	8	4	2	65	-	65	4.64
4	-1	1	1	3	-2	0	-2	5	1	1	-	0	-	4	0	-1	16	-6	10	0.71
5	1	1	3	1	0	1	1	4	0	1	-	0	-	1	0	2	16	-	16	1.14
6	2	3	2	3	2	6	5	3	4	3	-	3	-	6	3	3	48	-	48	3.43
7	-2	1	0	0	1	1	1	3	1	1	-	2	-	-3	0	1	12	-5	7	0.50
8	-3	3	3	3	2	-1	2	3	3	0	-1	-	0	3	-1	0	22	-6	16	1.07
9	4	2	2	3	-1	3	4	3	-1	4	3	-	3	6	0	1	38	-2	36	2.40
10	-2	1	-1	1	0	-3	-1	1	-1	0	-	-1	3	1	1	0	8	-9	-1	-0.07
11	2	1	4	1	-3	-1	0	1	2	-	-	-	-	4	1	1	17	-4	13	1.08
12	-1	0	-1	0	-1	-1	-1	3	-1	0	-	0	-	0	-2	0	3	-8	-5	-0.36
13	3	4	6	4	5	9	8	6	6	4	-	5	-	9	4	2	75	-	75	5.36
14	-3	-1	3	3	5	0	2	3	0	4	-	4	-	3	2	1	30	-4	26	1.86
15	1	-1	3	3	2	3	0	2	0	-1	-	0	-	3	2	1	18	-2	26	1.86
16	1	0	2	1	-1	1	0	-1	2	0	-	-1	-	2	1	1	11	-3	8	0.57
17	0	0	4	0	0	2	0	0	0	1	-	1	-	0	1	0	9	-	9	0.64

APPENDIX C (Continued)

4-hour Group

	Phases																Totals			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	(+)	(-)	NET	AVE.
18	0	0	1	-1	2	3	2	4	2	1	-	1	-	2	2	-	20	-1	19	1.36
19	0	1	2	1	0	3	2	4	1	0	-	0	-	2	0	0	16	-	16	1.14
20	1	2	1	1	0	2	0	2	0	1	-	1	-	1	0	0	12	-	12	0.86
21	3	3	6	4	3	6	4	4	2	4	-	4	-	7	4	2	56	-	56	4.00
22	4	4	7	3	7	8	7	0	7	4	-	5	5	9	5	2	77	-	77	5.13
23	4	4	6	4	7	8	8	1	7	3	-	5	5	8	5	2	77	-	77	5.13
24	3	1	5	3	-1	5	6	3	5	3	7	-	1	2	4	1	49	-1	48	3.20
25	-1	2	6	3	-4	1	1	0	0	0	0	-	3	4	3	1	24	-5	19	1.27
26	3	3	6	2	4	5	0	4	5	4	-	4	-	6	3	1	50	-	50	3.57
27	2	3	5	3	2	2	0	0	1	1	-	0	-	3	0	1	23	-	23	1.64
28	3	3	6	4	5	6	3	5	5	4	-	3	-	8	4	1	60	-	60	4.29
29	-	4	5	3	3	8	5	3	6	1	-	4	-	6	3	1	52	-	52	4.00
30	0	0	0	1	1	2	0	0	0	2	-	1	-	1	2	1	11	-	11	0.79
31	-2	1	-1	0	0	-2	1	0	-1	3	-	0	-	0	-2	-1	5	-9	-4	-0.29

APPENDIX D

AVIATOR FLIGHT EVALUATION

2nd Data Collection
Flight Phase Scores

8-hour Group

	Phases																Totals			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	(+)	(-)	NET	AVE.
1	0	3	4	3	2	4	1	2	0	-1	-	1	-	2	3	1	26	-1	25	1.79
2	0	1	5	0	4	5	5	3	0	3	-	5	-	8	1	1	41	-	41	2.92
3	1	4	6	3	1	4	7	5	2	4	-	1	-	8	-1	0	46	-1	45	3.21
4	3	3	6	3	1	8	2	4	5	4	-	5	-	9	4	3	60	-	60	4.28
5	1	1	4	3	-1	2	4	6	0	4	-	0	-	6	1	3	35	-1	34	2.43
6	2	3	3	2	0	4	4	2	0	2	4	-	2	8	1	1	38	-	38	2.53
7	2	1	6	2	2	3	2	3	0	1	-	1	-	4	2	2	31	-	31	2.21
8	3	3	6	4	2	6	6	5	5	5	-	5	-	9	4	0	63	-	63	4.50
9	3	1	5	4	7	8	7	6	5	2	-	4	-	5	4	2	63	-	63	4.50
10	1	1	3	4	2	5	6	6	4	3	-	3	-	6	5	1	50	-	50	3.57
11	3	3	4	3	2	8	4	4	5	4	-	4	-	7	4	-	55	-	38	3.17
12	-	3	5	3	2	5	1	-	-	4	-	5	3	3	3	1	38	-	38	3.17
13	3	-1	5	1	0	4	3	2	4	5	-	1	-	5	2	2	37	-1	36	2.57
14	4	4	6	4	0	6	5	6	0	1	5	-	6	9	5	2	63	-	63	4.20
15	4	4	6	4	7	8	5	5	6	4	5	-	6	9	5	3	81	-	81	5.40
16	4	3	6	3	7	9	5	4	7	5	-	2	-	9	5	2	71	-	71	5.07
17	1	3	2	3	0	-1	-1	0	-2	0	-	-1	-	4	2	0	15	-5	10	0.72

APPENDIX D (Continued)

8-hour Group

	Phases																Totals			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	(+)	(-)	NET	AVE.
18	1	1	5	3	2	5	6	6	1	2	5	-	5	9	1	0	52	-	52	3.40
19	2	-1	2	-1	4	2	1	3	1	1	2	-	2	5	2	0	27	-2	25	1.67
20	3	4	5	3	4	8	5	4	7	3	-	4	-	6	4	2	62	-	62	4.43
21	2	3	0	3	2	6	1	0	3	1	-	4	-	5	5	3	38	-	38	2.71
22	1	-3	-2	1	1	-4	-2	6	-4	-4	-	-2	-	-4	-3	0	9	-28	-19	-1.36
23	-3	1	6	4	1	2	5	4	-3	1	-	3	-	7	3	3	40	-6	34	2.43
24	-2	2	5	3	-3	3	1	-1	-1	1	-	4	-	3	4	1	27	-7	20	1.43
25	3	2	5	3	3	5	4	4	4	2	-	5	-	7	3	1	51	-	51	3.64
26	3	1	6	4	6	7	7	5	2	4	-	4	-	6	4	1	60	-	60	4.29
27	1	2	5	2	4	5	1	3	4	2	4	-	2	1	1	2	39	-	39	2.60
28	0	1	-1	1	0	0	2	4	1	0	-	3	-	5	2	1	20	-1	19	1.36
29	2	3	4	4	4	8	6	6	1	4	-	5	-	9	5	2	63	-	63	4.50
30	2	0	3	1	0	1	1	0	1	1	-	2	-	3	0	1	16	-	16	1.14
31	0	2	1	0	3	3	1	3	0	2	-	1	-	1	0	1	18	-	18	1.29
32	4	4	6	4	3	6	0	0	4	3	-	4	-	7	4	3	52	-	52	3.71
33	4	3	3	3	6	8	8	4	6	3	-	5	-	8	3	3	67	-	67	4.78
34	-1	1	4	-1	-1	-2	0	-	-1	1	-	0	-	-1	0	-1	6	-8	-2	-0.15
35	2	1	2	0	1	4	3	0	-	2	-	2	-	1	1	2	21	-	21	1.62
36	0	-3	3	1	-2	0	0	0	0	0	-	2	-1	1	1	0	8	-6	2	0.13
37	2	2	6	4	4	6	-1	5	4	4	-	3	-	7	3	0	50	-1	49	3.51

APPENDIX E

AVIATOR FLIGHT EVALUATION

2nd Data Collection
Aggregated Category Scores

4-hour Group

	Pre-flight		Fundamentals		Climbs		Enroute		Letdowns		Other	
	Score	Prop	Score	Prop	Score	Prop	Score	Prop	Score	Prop	Score	Prop
1	4	1.000	23	0.921	13	0.929	14	1.000	19	1.000	3	0.750
2	6	0.750	22	0.880	7	0.500	8	0.572	10	0.358	3	0.750
3	7	0.875	20	0.800	7	0.500	12	0.888	17	0.895	2	0.500
4	0	0.000	8	0.320	-1	-0.072	1	0.072	3	0.158	-1	-0.250
5	2	0.250	5	0.200	0	0.000	2	0.143	5	0.263	2	0.500
6	5	0.625	14	0.560	6	0.429	9	0.643	11	0.579	3	0.750
7	-1	-0.125	-3	-0.120	2	0.143	2	0.143	6	0.316	1	0.250
8	0	0.000	8	0.320	5	0.357	-1	-0.072	4	0.143	0	0.000
9	6	0.750	11	0.441	-2	-0.143	7	0.500	13	0.464	1	0.250
10	-1	-0.125	2	0.081	-1	-0.072	-3	-0.214	2	0.080	0	0.000
11	3	0.375	10	0.400	-1	-0.072	-1	-0.111	1	0.072	1	0.250
12	-1	-0.125	-3	-0.120	-2	-0.143	-1	-0.072	2	0.105	0	0.000
13	7	0.875	23	0.921	11	0.786	13	0.929	19	1.000	2	0.500
14	-4	-0.500	11	0.441	5	0.357	4	0.286	9	0.473	1	0.250
15	0	0.000	15	0.600	3	0.214	3	0.214	3	0.158	2	0.500
16	1	0.125	6	0.240	1	0.072	1	0.072	-2	-0.105	1	0.250

APPENDIX E (Continued)

4-hour Group

	Pre-flight		Fundamentals		Climbs		Enroute		Letdowns		Other	
	Score	Prop	Score	Prop	Score	Prop	Score	Prop	Score	Prop	Score	Prop
17	0	0.000	5	0.200	0	0.000	3	0.214	1	0.053	0	0.000
18	0	0.000	4	0.160	4	0.286	4	0.286	7	0.368	0	0.000
19	1	0.125	5	0.200	1	0.072	3	0.214	6	0.316	0	0.000
20	3	0.375	3	0.120	0	0.000	3	0.214	3	0.158	0	0.000
21	6	0.750	21	0.841	5	0.357	10	0.715	12	0.633	2	0.500
22	8	1.000	24	0.960	4	1.000	12	0.858	17	0.895	2	0.500
23	8	1.000	23	0.921	14	1.000	11	0.786	19	1.000	2	0.500
24	4	0.500	14	0.560	4	0.286	8	0.572	17	0.608	1	0.250
25	1	0.125	16	0.641	-4	-0.286	1	0.072	4	0.143	1	0.250
26	6	0.750	17	0.681	9	0.643	9	0.643	8	0.421	1	0.250
27	5	0.625	11	0.441	3	0.214	3	0.214	0	0.000	1	0.250
28	6	0.750	22	0.880	10	0.715	10	0.715	11	0.579	1	0.250
29	4	1.000	17	0.681	9	0.643	9	0.643	12	0.633	1	0.250
30	0	0.000	4	0.160	1	0.072	4	0.286	1	0.053	1	0.250
31	-1	-0.125	-3	-0.120	-1	-0.072	1	0.072	1	0.053	-1	-0.250

APPENDIX F

AVIATOR FLIGHT EVALUATION

2nd Data Collection
Aggregated Category Scores

8-hour Group

	Pre-flight		Fundamentals		Climbs		Enroute		Letdowns		Other	
	Score	Prop	Score	Prop	Score	Prop	Score	Prop	Score	Prop	Score	Prop
1	3	0.375	12	0.480	2	0.143	3	0.214	4	0.143	1	0.250
2	1	0.125	14	0.560	4	0.286	8	0.572	13	0.464	1	0.250
3	5	0.625	16	0.641	3	0.214	8	0.572	13	0.464	0	0.000
4	6	0.750	22	0.880	6	0.429	12	0.858	11	0.579	3	0.750
5	2	0.250	14	0.560	-1	-0.072	6	0.429	10	0.358	3	0.750
6	5	0.625	14	0.560	0	0.000	6	0.429	12	0.429	1	0.250
7	3	0.375	14	0.560	2	0.143	4	0.286	6	0.316	2	0.500
8	6	0.750	23	0.921	7	0.500	11	0.786	16	0.843	0	0.000
9	4	0.500	18	0.721	12	0.858	10	0.715	17	0.895	2	0.500
10	2	0.250	18	0.721	6	0.429	8	0.572	15	0.789	1	0.250
11	6	0.750	18	0.721	7	0.500	12	0.858	12	0.633	-	-
12	3	0.750	14	0.560	2	0.286	9	0.643	9	0.473	1	0.250
13	2	0.250	13	0.521	4	0.286	9	0.643	6	0.316	2	0.500
14	8	1.000	24	0.960	0	0.000	7	0.500	22	0.786	2	0.500
15	8	1.000	24	0.960	13	0.929	12	0.858	21	0.750	3	0.750
16	7	0.875	23	0.921	14	1.000	14	1.000	11	0.579	2	0.500
17	4	0.500	11	0.441	-2	-0.143	-1	-0.072	-2	-0.105	0	0.000

APPENDIX F (Continued)

8-hour Group

	Pre-flight		Fundamentals		Climbs		Enroute		Letdowns		Other	
	Score	Prop	Score	Prop	Score	Prop	Score	Prop	Score	Prop	Score	Prop
18	2	0.250	18	0.721	3	0.214	7	0.500	22	0.786	0	0.000
19	1	0.125	8	0.320	5	0.357	3	0.214	8	0.286	0	0.000
20	7	0.875	18	0.721	11	0.786	11	0.786	13	0.685	2	0.500
21	5	0.625	13	0.521	5	0.357	7	0.500	5	0.263	3	0.750
22	-2	-0.250	-8	-0.320	-3	-0.214	-8	-0.572	2	0.105	0	0.000
23	-2	-0.250	20	0.800	-2	-0.143	3	0.214	12	0.633	3	0.750
24	0	0.000	15	0.600	-4	-0.286	4	0.286	4	0.143	1	0.250
25	5	0.625	18	0.721	7	0.500	7	0.500	13	0.685	1	0.250
26	4	0.500	20	0.800	8	0.572	11	0.786	16	0.843	1	0.250
27	3	0.375	9	0.360	8	0.572	7	0.500	10	0.358	2	0.500
28	1	0.125	7	0.280	1	0.072	0	0.000	9	0.473	1	0.250
29	5	0.625	22	0.880	5	0.357	12	0.858	17	0.608	2	0.500
30	2	0.250	7	0.280	1	0.072	2	0.143	3	0.158	1	0.250
31	2	0.250	2	0.081	3	0.214	5	0.357	5	0.263	1	0.250
32	8	1.000	21	0.841	7	0.500	9	0.643	4	0.143	3	0.750
33	7	0.875	17	0.681	12	0.858	11	0.786	17	0.608	3	0.750
34	0	0.000	2	0.081	-2	-0.143	-1	-0.072	0	0.000	-1	-0.250
35	3	0.375	4	0.160	1	0.143	6	0.429	5	0.263	2	0.500
36	-3	-0.375	6	0.240	-2	-0.143	0	0.000	1	0.053	0	0.000
37	4	0.500	20	0.800	8	0.572	10	0.715	7	0.368	0	0.000

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13. ABSTRACT

Data reflecting the knowledge, skill, and satisfaction of aviators in combat readiness training (CRT) flight status, was collected. The aviator sample consisted of one group flying the T-1A aircraft at a rate of 4-hours per month and another flying 8-hours per month. The data collection methods are described, and the results and conclusions from a comparative analysis are presented.

14. KEY WORDS	LINK A		LINK B		LINK C	
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PROFICIENCY						
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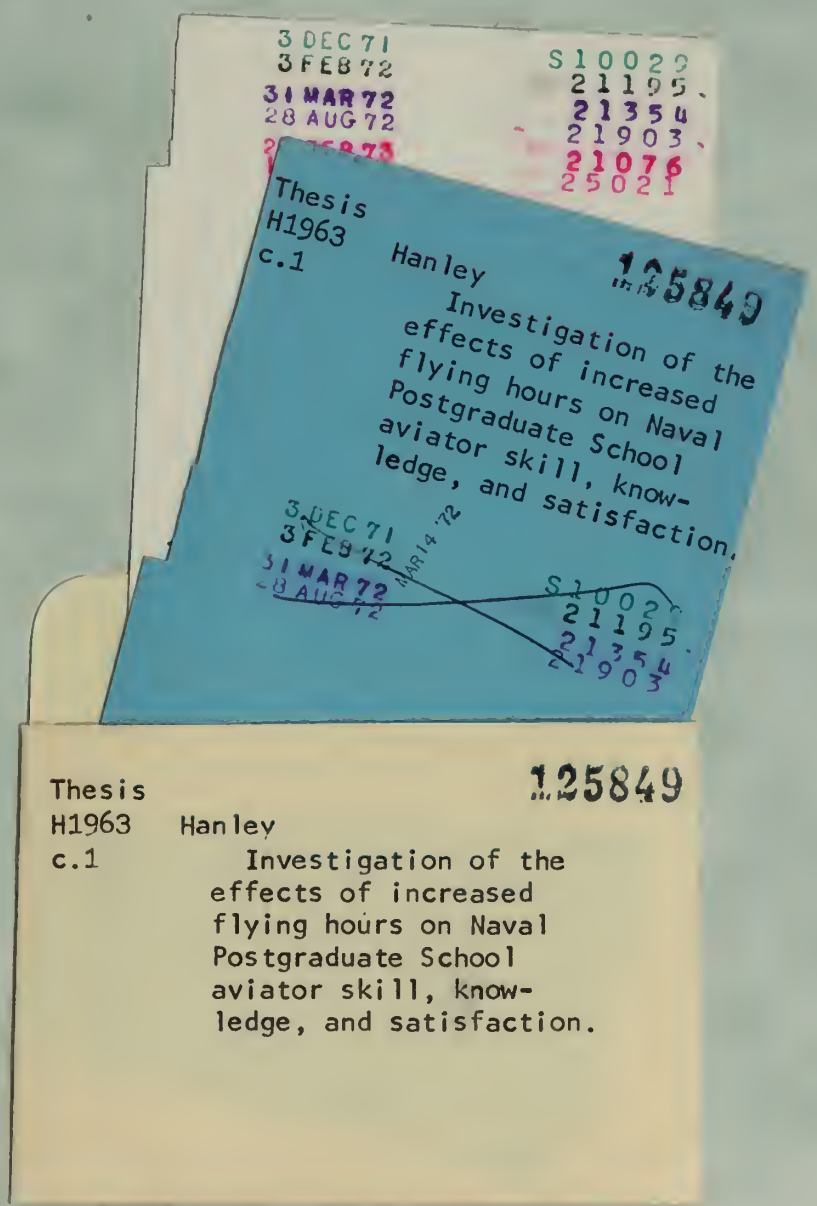

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Investigation of the effects of increased flying hours on Naval Postgraduate School aviator skill, knowledge, and satisfaction.